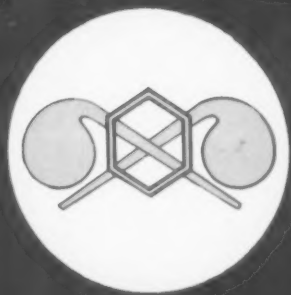
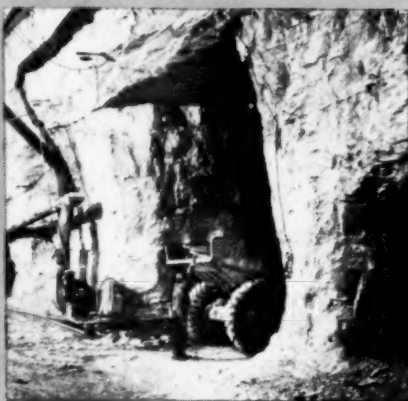


CHEMICAL CORPS JOURNAL



Official Publication of the Chemical Corps Association
Washington, District of Columbia



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Chemical Corps Journal

OFFICIAL PUBLICATION OF THE CHEMICAL CORPS ASSOCIATION

Room 523, 1129 Vermont Ave. N.W.

Washington 5, D. C.

Lt. Col. HAROLD B. RODIER, CC, Ret., Editor

Vol. II

APRIL, 1948

No. 4

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INDEX

Editorials	2
From Your National President	3
By Ludlow King	
Welcome to Third Annual Meeting	4
By Lt. Col. Thos. H. Magness, Jr.	
Chemical Warfare in World War II	5
By Al Leggin	
Military Industry Preparedness	7
Du Pont's War Story	9
New Category System for Non-Regular Officers	22
Discharge Certificates	23
Overseas Service Bars	23
Award to Ed Treacy	23
Report of Research and Development Committee	24
Chemical Corps Extension Courses	25
Annual Meeting May 20-21-22	27
Election of Directors-at-Large Ballot	29
German Smoke Pot Projector	31
By Geo. E. Miles and L. Wilson Greene ..	
The 256th Goes from War to Peace	34
Meet Your Chapter Officers	45
Challenge to Our Chapters	50
By Fred M. Jacobs	
Chapter News	51
Secretary's Corner	56
Army Day 1948	14
Fire for Effect	17
By Lt. Col. Edgar Bell, CmlRes	
Suggestion Systems Pay	37
Russian Aerial Release Case	41
Discovery of Mustard Gas	42

INDEX TO ADVERTISERS

BECCO Sales Corp.	16	Industrial Rubber Goods Co.	56
Bischoff	49	Mathieson Chemical	6
Diamond Alkali Co.	44	Merck Co.	Inside Back Cover
Dow Chemical Co.	Back Cover	Niagara Alkali Co.	13
Dryden Rubber Division Sheller		Pemco Corporation	39
Mfg. Co.	43	Pittsburgh Coke and Chemical Co.	40
Evans Research & Development Co.	54	Pittsburgh Plate Gas Co.	Inside Front Cover
Ferro Enamel Corp.	53	Professional Directory	21
Harshaw Chemical Co.	24	Vulcan Copper & Supply Co.	52
Hooker Electrochemical Co.	41		

"... to sponsor new developments designed to increase the efficiency of chemical warfare means, to collect and disseminate useful knowledge with respect to chemical warfare and related subjects, to foster a spirit of good will and cooperative endeavor among its members and with industry, and to perpetuate the friendships, memories and traditions growing out of their service with the Chemical Corps . . ."

The Chemical Corps Association

COL. LUDLOW KING, *President*
Washington, D. C.

FRED M. JACOBS, *Secretary-Treasurer*
Room 523, 1129 Vermont Avenue N.W.
Washington 5, D. C.

Publishers of

The CHEMICAL CORPS JOURNAL

Published quarterly: January, April, July and October
Subscription, \$2.00 per year

Entered as Second Class matter at Washington, D. C.

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HOWARD L. SHINE

Vol. II

APRIL, 1948

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THE SIGNS OF THE TIMES

Within the last few weeks the world situation shows signs of moving toward a momentous climax. The greater part of our membership justifiably can feel that they have been alerted for possible participation in the stern military situation. Members who are enrolled in the Chemical Reserve must be giving serious thought to the possibility of their being recalled to active service. Those of our membership who are particularly concerned with the industrial picture can read the handwriting on the wall. Two years ago the movement was all for reconversion of industry from war activities to the arts of peace. Does one go too far in suggesting that this Nation is at the point of a reversal in this trend?

Many of our members are neither in the Reserve nor are directly engaged in the chemical industry. Nevertheless, their background of experience marks them for involvement and participation in some phase of the military or industrial activities which must result from any climatic evolution of the existing world emergency.

It is a time for self-searching. Each individual should ask himself "What can I do, what ought I do, what must I do to best contribute toward the implementation of our national defense?" God send that America may be spared the necessity of fighting another war. Nothing can obviate the necessity that we at once be prepared to fight it if need be.

THE ANNUAL MEETING

A year ago in speaking of the Annual Meeting of the Chemical Corps Association the *News* suggested that every member of our Association who contemplated attending the Annual Meeting, write to some of his particular friends of service days, urging that they also attend the meeting. The object, of course, was to insure that the meeting be enriched by the opportunity for individual reunions of the members with their particular pals.

This idea looks just as good today as it did a year ago, and we warmly urge that you add to the pleasure and profit of the meeting to be held May 20, 21 and 22, by endeavoring to persuade some of your friends, whom you have possibly not seen since service days, to meet you in Edgewood for the occasion.

You are urged to attend. Who knows what world-shaking events may transpire before another year has passed? This may prove to be an exceedingly significant opportunity to re-establish contacts and to become reoriented in the Chemical Corps situation.

CAST YOUR BALLOT!

In the center of this *Journal* will be found a ballot for the election of Directors-at-Large of the Chemical Corps Association for the ensuing year. Members are urged to take the time to mark up these ballots and send them in not later than May 10.

The caliber of the men who have been placed in nomination is unquestionably so high that whatever group of Directors-at-Large may be elected, it is certain to reflect credit and honor upon our Association. It is, nevertheless, important that these officers be elected by a large and representative vote and you are strongly urged not to overlook your duty and privilege of casting your ballot.

THE ASSOCIATION MAKES A MOVE

Please take note that effective April 15, 1948, the address of Headquarters Chemical Corps Association will be:

CHEMICAL CORPS ASSOCIATION
Room 523, Portland Building
1129 Vermont Ave. N.W.
Washington 5, D. C.

From Your National President

Armed Forces Chemical Procurement

On September 18, 1947, Congress passed the bill which joined our three Armed Forces together under the directorship of the Secretary of Defense. Three of the numerous reasons for this constructive change were:

1. To establish closer cooperation between the Forces.
2. To eliminate duplication and thus reduce expenses.
3. To centralize procurement of items common to all three Forces and thus eliminate competitive buying between them.

The public and industry have been waiting for indications that the mentioned purposes have become realities, or at least for the announcement of a plan providing for their establishment.

Industry has become utterly confused from questionnaires from the individual forces and finds it impossible to respond with intelligent replies, each independently requesting information regarding the quantity of "Material X" it can expect in case of an emergency. The question cannot possibly be answered without first knowing what demands will be placed upon the production by the other two Forces. In most cases, industry would much prefer to deal with one central agency which would be charged with the responsibility of buying all "Material X" for the entire Armed Forces. To this agency industry could and would gladly cooperate in providing figures on present production of "Material X," possible production with equipment presently used, possible production if other equipment now used in production of other items were converted to produce "Material X," etc.

How much simpler and more economical it would be for industry to deal directly with only one agency. It would stop the duplication of inspectors in their plants, require the manufacturers to become acquainted with only one form of contract, bookkeeping, and procedure to follow in producing for the Armed Forces. It would then become the responsibility of the agency to allot the production to the three Forces in accordance with instructions from higher authority. Of course, it is fully realized that all materials could not be purchased in this

manner, but it is perfectly obvious that many could with decided advantages.

Thousands of chemical items are purchased by the three Forces, but it has been estimated that a few hundred will account for 80 percent of the total dollar procurement. Many of these are common to all three Forces, or could be with slight changes in the specifications without affecting the required performances.

Because of the foregoing, it is reasonable to believe that the Secretary of Defense will establish a central buying agency for those chemicals commonly used by the three Forces. Then the question arises, "Who will procure the common chemical requirements for the Armed Forces?" The Chemical Corps, with its body of trained chemists, is obviously best qualified to carry out this assignment. If the responsibility is designated elsewhere, it will become necessary to transfer many chemists from the Chemical Corps to the other agency. It is apparent the chemists in the Chemical Corps will perform this function regardless of the agency specified. It seems reasonable to believe that the Secretary of Defense will assign this chemical procurement function to the Chemical Corps, which is the most logical and capable of delivering efficient performance.

Edgewood Meeting

In keeping with the Executive Committee's recommendation to change the name of our Association to the Armed Forces Chemical Association, arrangements are now being made to have appropriate personnel from the Air Force and Navy and War Department join with us in our 3rd National Meeting at Edgewood on May 21. Our agenda for the dinner will include short but significant talks from these Generals and Admirals.

In reviewing the plans for our 3rd National Meeting it is apparent that it will prove even more interesting and colorful than the previous meetings. Much of this is attributed to our current effort to secure the membership and active participation of Naval and Air Force personnel whose field of interest is related to chemical activities.

Our Executive Committee is anxiously looking forward to seeing and visiting with you again at Edgewood.

—LUDLOW KING

Welcome to Third Annual Meeting

By LT. COL. THOMAS H. MAGNESS, JR., *Chairman*

The Third Annual Meeting of the Chemical Corps Association will be held at the Army Chemical Center, Maryland, on Thursday, Friday and Saturday, 20, 21 and 22 May 1948. It is hoped that each and every member of the Association who can possibly do so will come back to Edgewood to attend this meeting and to renew contacts with his or her former associates. General Bullene has expressed himself as being most happy that the Army Chemical Center can again act as host to the Association.

The plans of the national officers and of the Edgewood Chapter of the Association call for a number of new features this year. Among these are trips through Chemical Corps plants at the Army Chemical Center which were not in operation at the time of the 1947 convention. It is planned to conduct tours to such plants as those engaged in the production of gas masks, M25 grenades, M7 CN grenades, smoke pots, etc. Another attraction for which plans are being laid is a complete exhibit of some very important chemical item through all its various stages of procurement. As part of this exhibit, plaques listing the names of contractors who did work on the end item and the components will be displayed. Last, but not least, among this year's novelties will be a different type demonstration from that hitherto given. Since many of the members have seen the set school demonstration, it is contemplated varying the shoot this year to feature new developments in so far as is consistent with security regulations.

Not all of the convention's features will be new, and certainly no member of the Association would want them to be. As the program (page 27) indicates, there will be the annual lunch at 12 o'clock noon on 21 May, the mixer party from 5 to 7 p.m. that afternoon, the dinner at 7:30, and the dance at 10. Maj. Gen. Alden H. Waitt, Chief, Chemical Corps and Honorary President, Chemical Corps Association, will be a speaker at the dinner and arrangements are being made to have another speaker or two of national prominence address the gathering. It is expected, and hoped, that a group of some 400 attendants of the American Chemical Society Convention in New York City, many of whom, of course, are also members of our Association, will arrange to attend our annual dinner as well as the business meeting on Saturday, 22 May.



LT. COL. THOMAS H. MAGNESS, JR., Cml.C.

Members will be arriving at Edgewood from 20 May on. The attention of the various local chapters of the Association is called to the following: Arrangements will be made by Col. R. O. Gordon, Army Chemical Center, to stop certain indicated trains for the convenience of visitors. If you desire to have such arrangements made, please contact Colonel Gordon.

A Master Committee and several subcommittees have been appointed to arrange details and carry out the program. Below is a list of the members of the Master Committee:

Lt. Colonel Magness, chairman; Mr. Schwanke, registration and collections; Major Glover, billeting and messing; Lt. Colonel Joyner, dinner and entertainment; Major Mitman, demonstration; Lt. Colonel Gordon, transportation; Mr. Kileski, business meeting facilities; Mr. Kulp, interim activities.

The national officers of the Association and the Edgewood Chapter extend to all of our members and friends a most hearty and cordial welcome.

Chemical Warfare in World War II

Association Publishes Volume on the Story of the Chemical Warfare Service

By AL LEGGIN
Vice President, C.C.A.

As previously announced in the Chemical Corps News, the Association soon will have ready for sale and distribution a one-volume account of the activities of the Chemical Warfare Service in World War II. There has been a long-standing need for a single volume on the activities and accomplishments of the Service during the recent war, and the Association takes pride in sponsoring the publication of this comprehensive survey of the CWS from 1939 to the end of World War II.

This volume was prepared by the Historical Section of the Office of the Chief. While the Historical Section declines to label the volume as a "history," it is essentially a historical report covering the mission of the Chemical Warfare Service and how that mission was executed during the recent war. Following VJ-Day, various elements of the Office of the Chief compiled reports covering all or a part of their wartime activities. These reports were usually hastily prepared, did not represent extended research, were generally unrelated to the wider scope of activities of the Service and, with one or two exceptions, were never published. Therefore, this volume represents the first attempt to survey the myriad functions and activities of the Service and to show the inter-relation of these activities. The Department of the Army is engaged in a historical program which calls for the publication of an official history of the United States Army in World War II. This Department of the Army History will consist of approximately one hundred volumes, of which five volumes are allocated to the Chemical Corps. It will be several years, however, before these five volumes are completed and published.

This single volume on "The CWS in World War II," therefore, will serve two purposes. It fills the gap between the various unpublished and rather fragmentary war-end reports of the various elements of the Service on the one hand, and the more definitive history which will eventually become available. Also, it fills the requirement for a useful one-volume account pending the publication of the official five-volume history. The volume is liberally illustrated with charts

and pictures covering every phase of the activities of the Service.

Though the activities of the Service are treated briefly in this volume, it will be found that no important phase of the Service's activities has been omitted. Some of the so-called "forgotten" men and units of the CWS receive treatment in this volume. The mission and activities of Chemical staff officers and CWS service type units get some much-deserved credit. The general reader is also given a much-needed picture of the non-gas mission and operations of CWS personnel and units in air and ground combat. Beginning with the origins of the Chemical Warfare Service in World War I, the volume traces the history of the Service between World War I and World War II and the expansion of its mission and activities during World War II. The scope of the volume is well represented by the following chapter headings: The CWS Prior to World War II; Organization for War; Research and Development; Procurement and Supply of CWS Material for the Armed Forces; Training of Service and Combat Troops; Readiness for Gas Warfare; The CWS Mission in Theaters of Operation; The 4.2-Inch Chemical Mortar; Smoke Weapons, Munitions and Operations; Portable and Mechanized Flame Throwers; and a closing chapter on "By-Products From the Implements of War." The volume also has fifteen appendices which contain statistical data on all types of chemical units and the Army-Navy "E" awards to CWS contractors.

While specialists will not find in this volume the COMPLETE record of activities, it is felt that everyone connected with the Chemical Warfare Service during World War II will find the treatment of their activities both interesting and informative. The volume certainly provides the general reader with an excellent account of the contributions of the Service in World War II and will give any reader a comprehensive view of the Service which is not available in any other published form. A small portion of this work, that which treats of purely administrative work in the Office of the Chief, may seem somewhat prosaic to some readers. However, the record of operations even in the Zone of Interior is generally inspiring, and the story of CWS personnel, weapons and units in the theaters of operation present a record

(Continued on page 50)



isn't that the Mathieson Plant?

"It's one of them, Mr. Jones—the Niagara Falls plant."

Yes, Mr. Jones and there's another at Saltville, Va., to serve the southeast, and a third at Lake Charles, La., serving the southwest. With three plants, Mathieson offers triple flexibility in deliveries of caustic soda. Call it three sources of supply. That's why weather, breakdowns, railroad or labor conditions seldom keep Mathieson from making prompt deliveries.

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CHEMICALS

Military-Industry Preparedness Announced by Munitions Board

A component of the preparedness program has reached a point whereupon representatives of the Armed Services are about to start contacting some 11,000 U.S. industrial plants to discuss production capacity of specific plants; what the plants can produce in the way of products for war, and how much. Other production problems will be discussed by the plant management and representatives of the Army, Navy and Air Force.

Cumulatively, the knowledge gained from the person to person contact between U.S. Industry and the U.S. Military forces will provide the government with an up-to-date inventory of U.S. Industry's capacity for production for the wartime requirements of the Armed Forces. The results will be kept current by means of a perpetual inventory and will provide a composite picture of where the bulk of requirements for war will be drawn from in an emergency.

In addition, the results of the program ultimately will eliminate competition for the output of a single plant between procurement agencies of the Armed Forces thereby enhancing wartime procurement, eliminating much confusion and providing greater efficiency and economy in procurement.

After careful study, the Munitions Board allocates the claimed capacity to the Services or combination of Services in accordance with decisions most compatible to the interests of National Security.

The allocation of private industrial capacity for procurement of the Armed Services is part of the military aspects of industrial mobilization planning, a responsibility of the Munitions Board. Although a great stride in military-industry preparedness, it is but a part of a much greater preparedness activity contemplated by the government. The National Security Resources Board, which is charged with overall industrial mobilization planning is preparing methods and procedures for the allocation of industrial capacity for the civilian economy and industry, correlating those requirements with the military requirements.

There is an estimated 86,000 industrial plants of recognizable size and productivity in the United States. It is obviously impossible to cover all these plants through survey and, in wartime, to marshal their power directly. Consequently, it is the eventual goal of the program to cover between



THOMAS J. HARGRAVE
Chairman, Munitions Board

twenty-two and twenty-five thousand plants. Coverage of that number of plants would mean that 90 percent of the productive capacity of the United States would have been surveyed under the program.

The assignment of production capacity in manufacturing facilities by the Munitions Board to a military department for its procurement agencies to accomplish peacetime planning for war procurement of designated quantities of specified items of material at a specified rate of production makes possible tentative schedules for the items that Industry will produce for the Armed Services in time of war.

Since planned war requirements vary with strategic plans, the allocation and production schedules will be both tentative and variable.

Now that the capacity of the first group of plants has been tentatively allocated to the Armed Services, representatives of the three military

departments will approach the plants. The program on the part of industry is purely voluntary.

When contacting the management of a plant allocated to his particular Service, the military representative will show the management the product or products the Service is desirous of having that plant manufacture in the event of an emergency. The management will select the product it believes itself best capable of producing with maximum speed and volume in an emergency. It will provide the Service representative with data concerning its production ability and potential production problems will be discussed.

Other information vital to efficient war production will be gathered as part of the program.

"If only partially completed by the time an emergency occurs, the work already completed will be of inestimable assistance in gearing that part of our industry to emergency war production.

"Time, in modern warfare, is one of its most important elements. It is absolutely necessary that our Nation's industry be converted from peacetime production to war production quickly, and this program, whether completed or partially completed, will save time in expediting the efforts of our industry in the production of the munitions required by our Fighting Forces during a war."

The purpose of the program for the allocation of private industrial capacity for procurement planning by the Armed Services is the development of a comprehensive system for predetermination of sources of supply. Its objectives are to expedite transition of industry from production of goods for peacetime consumption to meeting the requirements of the Armed Services of the United States.

Specific objectives of the program are as follows:

- A. To determine where necessary end items, based on mobilization requirements, can be obtained with particular emphasis on those items likely to be most critical in a future war.
- B. To assist in orderly distribution of the initial increment of the wartime manufacturing load by means of allocating production capacity for the production of designated products at a specified rate of production.
- C. To acquaint industry with part of the task it will be expected to perform, and encourage its cooperation in planning for mobilization of industry.
- D. To eliminate competition between the procurement agencies of the Armed Forces for the output of a single plant.
- E. To provide a current record of competent

producers together with estimates of their capacities to meet prospective demands.

- F. To determine what items of supply cannot be provided by conversion of privately owned manufacturing capacity and thereby establish a basis for calculation of requirements for construction of new facilities.
- G. To minimize the need for construction of new facilities during war, by fostering thorough utilization of existing facilities.
- H. To foster production cost estimation in advance by industry in order to expedite negotiation of contracts for desired material.
- I. To have in being a system which readily can be adapted to clearance of important contracts by a central control agency.

The military representative approaching a specific plant, the capacity of which has been allocated to his Service, is known as an "Armed Services Procurement Planning Officer." He is assigned mobilization planning cognizance by his Service to coordinate the planning for the war load in specified manufacturing plant or plants.

The Armed Services Procurement Planning Officer is created to facilitate mobilization planning with plant officials. He prevents unnecessary plant visits, surveys, and communications, and coordinates planning requirements of the Armed Forces in the facility or facilities over which he has planning jurisdiction. He is in effect an administrative representative of the National Military Establishment for the plants under his jurisdiction.

The allocation of industrial capacity program provides no limit as to size of facilities. Small and large firms, especially in the cases of military items similar to commercial types and where conversion problems are minor will be considered. The program recognizes that there must be adequate reservation for the normal peacetime capacity of a given industry for civilian needs and the requirements of other war programs during wartime.

In summarizing the allocation of Private Industrial Capacity for Procurement Planning of the Armed Services program, Mr. Hargrave said: "Ultimately, the results of this effort will provide the United States Military Establishment with an accurate, comprehensive knowledge of its sources of supply in war, and the best possible planning basis for planning wartime, military procurement in peacetime. It will provide individual manufacturers with a knowledge of their probable production role in the event of war—a knowledge which will enable them to prepare by having

(Continued on page 49)

Du Pont's War Story

The Du Pont Company's services for the Chemical Warfare Service during World War II included the design, construction and operation of two government-owned plants at Niagara Falls, N. Y., and Marshall, W. Va.; design and procurement services for a third government-owned plant, the Rocky Mountain Arsenal, near Denver, Colo., and the manufacture of various chemical products at its own commercial plants.

Negotiations leading up to the construction of the Niagara Falls plant started as early as June, 1939, and actual work started nearly a year before the United States entered the war. This plant was for the manufacture of CC-2, a secret chemical developed at Edgewood Arsenal to impregnate clothing for the protection of personnel in gas warfare.

The Marshall plant was the outgrowth of discussions which began in January, 1942, regarding this country's requirements of acetylene tetrachloride (also known as tetrachlorethane, or "tetra"), the solvent for both CC-2 and RH-195, a poison-gas decontaminant developed by the Du Pont Company and used by both the Army and Navy to impregnate uniforms. The Marshall plant was completed with facilities for the production of acetylene tetrachloride, RH-195, and hexachlorethane and perchlorethylene, both used in the manufacture of smoke-screen chemicals. The RH-195 facilities were never used because the government's requirements were met by production at another location.

Du Pont's services in connection with the Rocky Mountain Arsenal were actually performed under contract with the U. S. Army Engineers, who constructed the plant for operation by the Chemical Warfare Service. Designs and specifications for the equipment, and basic processes for the manufacture of mustard gas (HS) and Lewisite (M1) were supplied by the Chemical Warfare Service.

Niagara Falls Plant—Preliminary Negotiations

This plant was one of four Chemical Warfare Service plants built for the production of CC-2. Constructed by the Du Pont Company adjacent to the commercial plant of its Electrochemicals Department at Niagara Falls, it was the first of the CC-2 facilities to be built and operated for the government by private industry. It was followed by other plants built by the Dow and Monsanto Chemical Companies at Midland, Mich., and St. Louis, Mo., and by the government at Edgewood Arsenal, Md.



CRAWFORD H. GREENWALT
Tenth President of E. I. du Pont de Nemours & Co.

In the summer of 1939, several months before the start of World War II, representatives of the Chemical Warfare Service first approached the Du Pont Company to obtain assistance in developing a manufacturing process for CC-2, a chemical which CWS was already making on an experimental basis at Edgewood Arsenal. The CWS also wished to determine whether Du Pont would bid on a contract for the design and construction of a plant for the production of five tons of CC-2 per day.

That fall Du Pont's Executive Committee authorized bidding on an "educational order" calling for the design, construction and operation of a pilot plant and the design and construction of a full-scale plant. Bids submitted by Dow, Monsanto and Du Pont, however, indicated that the estimated cost of work as originally contemplated would be above CWS expectations. It was thereupon decided to postpone construction of a full-scale plant and re-advertise for bids on an order comprising only the construction and operation of a pilot plant and the design of a large plant.

Early in 1940 Du Pont bid again and in March an educational order contract was executed with the company. The contract called for the production, testing, packing and delivery to CWS of 1,000 pounds of CC-2; the furnishing of a complete production study based on the operation of a pilot plant which was to be used for producing the 1,000 pounds of CC-2, and the preparation of complete factory plans for the construction and operation of a five-ton-per-day CC-2 plant. At Du Pont's request, profit was to be limited to 10 percent of the cost of performing these services.

Trend of War Alters CWS Plans

Du Pont immediately undertook laboratory investigations for the development of a suitable full-scale manufacturing process. In less than two months, however, word came from CWS that in view of the tense international situation the Service might have to request bids for a full-scale plant prior to completion of the educational order. By August, 1940, it was agreed that Du Pont would draw up basic design and would procure equipment for four CC-2 plants contemplated under the same program. This in spite of the fact that the process being developed was recognized as being far from perfect and had not even been tested in pilot-plant operations.

Such was the urgency of this program that Du Pont began preliminary design for a full-scale plant on August 26, only four months after the start of research on a full-scale manufacturing process and three weeks *before* the start of pilot-plant operations. Due to the emergency, moreover, considerable work was done months before a letter of intent was issued, followed early in 1941 by the formal contract.

Contract W-266-CWS-117 provided for the construction of a five-ton-per-day CC-2 plant by Du Pont at Niagara Falls, the government acquiring the necessary land. Du Pont also agreed to procure equipment for this plant and similar ones to be constructed by Dow, Monsanto and the Chemical Warfare Service, as well as agreeing to furnish design and engineering services for the three other plants. The contract was of the cost-plus-fixed-fee type.

Niagara Falls Plant—Construction

Construction started on February 1, 1941, and a month later Du Pont completed, at its own Niagara Falls plant, the 1,000-pound production of CC-2 under the educational order. In the meantime, CWS had decided that the full-scale plant at Niagara Falls should be completed ahead of the three others scheduled under the same program. Equipment and materials for Niagara

Falls accordingly were given priority to achieve this objective. Construction of the original facilities was completed in February, 1942.

Hardly had the first unit been completed, however, before CWS indicated their plans to double the capacity of the Niagara Falls plant, as well as that of the two others operated by Dow and Monsanto. After considerable discussion and negotiation, a letter contract to this effect was signed in October, followed by the formal contract in January, 1943.

Actual construction on the expansion started late in October, 1942 and was completed in December, 1943. Total cost of all facilities was approximately \$4,775,000.

Niagara Falls Plant—Operations

With the full-scale plant under construction, negotiations were started for a Du Pont-CWS agreement to provide for Du Pont operation of the Niagara Falls plant. Du Pont felt that the initial operating contract should be negotiated on a cost-plus-fixed-fee basis, since the product involved was an organic chemical which had never been produced before on a large scale, and since any other type of contract would introduce the possibility of the contractor either incurring a financial loss or making an excessive profit. All subsequent operating contracts were on a fixed-price basis.

In June, 1941, Contract W-266-CWS-148 was formally approved and signed for the initial production of 1,585 tons of CC-2. Du Pont also agreed to train key personnel of the Dow and Monsanto Chemical Companies' CC-2 plants for a fee of \$1. The training of Du Pont operating personnel, it was agreed, could fall under the educational order.

Operations started in September, 1941, but the plant did not reach its rated capacity until July, 1942. During that time, and even later, a number of operating difficulties had to be ironed out, the principal trouble being an insoluble residue that could not be entirely eliminated in the final processing step. An exhaustive research program directed at improving production methods was started in May, 1942, and by January 1943 the quality of the product had improved so that about 80 percent averaged specification grade. By September over 96 percent of the CC-2 analyzed was of specification grade.

Meanwhile, manufacture of the initial quantity of 1,585 tons of CC-2, as provided by the contract, was completed early in 1943. Supplemental fixed-price contracts provided for additional quantities until May 4, 1945, when operations were terminated. At that time a total of 14,

179,074 pounds of CC-2 had been produced at Niagara Falls. As early as January, 1944, the Chemical Warfare Service had requested reduced production because of a sudden change in requirements, brought about by the accumulation of stocks of CC-2 in the continued absence of gas warfare.

The Niagara Falls plant was awarded the Army-Navy "E," for excellence in production, on November 6, 1942. Three supplementary star awards were received for continued high production standards.

The Marshall Plant

Early in 1942 it became clear that the Army needed new plant capacity for acetylene tetrachloride and dichloro-dimethyl hydantoin, known as RH-195. The Du Pont Company, working with the Navy, had developed the use of RH-195 some years before as the active agent in a decontaminant for mustard gas. The Army later became interested in RH-195 and in 1938 bought some for experimental work at Edgewood Arsenal. Extensive tests eventually proved that the Army's CC-2 was more stable than RH-195, but that RH-195 was stronger and more soluble than the other compound. Tetra is used as the solvent for both RH-195 and CC-2.

By April, 1942, it was estimated that the combined Army-Navy requirements for RH-195 could be met by the combined production of the Niagara Falls and El Monte, Calif., plants of Du Pont's Electrochemicals Department, but it was thought advisable to provide a greater safety margin for this critical material. Accordingly, plans were discussed for a 3-ton-per-day plant. For strategic reasons the Chemical Warfare Service did not want the additional capacity to be located at existing plant locations.

The choice eventually fell to a site adjacent to a chlorine plant being constructed for the government. This was on the Ohio River about eight miles north of New Martinsville, W. Va. The plant was to be operated for the Defense Plant Corporation by Columbia Alkali Corporation, a subsidiary of the Pittsburgh Plate Glass Company.

During contract negotiations, plans were changed relative to RH-195 requirements, and the contract, dated July 8, 1942, provided only for the construction of acetylene tetrachloride facilities capable of turning out 126,000,000 pounds of refined tetra annually. Construction started on August 11, 1942, and the first tetra was produced 11 months later.

Meanwhile, CWS decided again to install RH-195 facilities at the Marshall plant, along with

facilities for the production of hexachlorethane, used in the manufacture of chemical smoke. In December, the contract was supplemented to provide for this revision, and on February 2, 1943, construction started on this part of the project. A month later CWS advised that they wished Du Pont to manufacture perchlorethylene. Perchlorethylene is also used in the manufacture of chemical smoke.

The cost of construction, which was closed out on December 15, 1943, was \$4,500,000.

Marshall Plant—Operations

The first production of tetra was authorized by a letter contract dated May 20, 1943. This was followed in October by formal contracts authorizing the production of tetra, hexachlorethane, and perchlorethylene.

Production of tetra began in July, 1943, followed by "hexa" and "per" start-up in September. RH-195 was never made at the Marshall plant, as government requirements were met from production at Du Pont's own facilities at El Monte, Calif.

During the fall of 1944 the production of some materials at Marshall was dropped. The perchlorethylene contract was terminated on September 30 and the hexachlorethane contract was terminated a month later. Facilities used for the manufacture of these products were placed in stand-by condition and the operating personnel were released or transferred to other work, namely, the tetra operation, as additional quantities of that product were ordered by the government for delivery during the last quarter of 1944.

About the first of October it became apparent that additional quantities of trichlorethylene would be required to relieve a severe shortage. After considerable discussion among WPB, CWS and Du Pont officials, it was decided to install trichlorethylene capacity at Marshall, as production could be effected more quickly and more cheaply there than at most other available locations. The first refined trichlorethylene was produced at Marshall about the middle of January, 1945.

The contract for the production of acetylene tetrachloride was terminated on May 31, 1945, after 22 months of operation. For the next three months, operations at Marshall were limited entirely to trichlorethylene. This production was continued primarily for the purpose of keeping the plant in operation so that conversion to other materials could be made immediately in case of war necessity.

The trichlorethylene contract was terminated

August 18, 1945, four days after the Japanese surrender.

Total Marshall plant production follows: refined tetra, 58,290,019 pounds; perchlorethylene, 50,211,101 pounds; hexachlorethane, 34,525,300 pounds; refined trichlorethylene, 25,796,629 pounds.

The Army-Navy "E" was awarded the Marshall plant on October 27, 1944, followed by a star award on April 24, 1945.

Rocky Mountain Arsenal

The Rocky Mountain Arsenal is located on a site of approximately 30 square miles in the rolling prairie land northeast of, and bordering on, the city of Denver, Colo.

Six prime contracts for the design and construction of the arsenal were issued by the government. Du Pont prepared arrangement drawings for the HS and M1 manufacturing areas and processes. It also expedited and inspected all process and some other equipment at the plants of suppliers and acted as a consultant on virtually all phases of the work.

Origins

Since World War I the Chemical Warfare Service has maintained research and pilot-plant facilities at Edgewood Arsenal for the manufacture of war gases. When the National Defense Program got under way, this country's only source of the so-called "poison" gases was at Edgewood, so plans were made to expand these facilities and build new plants, first at Huntsville, Ala., and Pine Bluff, Ark., and later at Denver.

The basic design for these new arsenals was supplied by the Technical Division of the Chemical Warfare Service. The Huntsville and Pine Bluff Arsenals were designed on the basis of small unit operations, as at Edgewood, but when the decision was made, early in 1942, to construct an additional arsenal at Denver, the Army realized that both manufacturing economies and early plant completion could be achieved by altering the plant lay-out so as to consolidate a large number of small manufacturing units into a smaller number of larger units. This grouping of plant units was considered safe in view of Denver's location—i.e., its distance from the coast and probable security from air attack.

Contract Negotiations

The Army, seeking the benefit of a large chemical company's wide manufacturing experience and wishing to obtain the immediate services of a seasoned design group, formally requested the Du Pont Company on May 26, 1942, to make a re-arrangement of the Edgewood unit-plan manufacturing areas as the agent of the Technical Division, CWS, and to suggest substitutions for critical construction materials. At the same time Du Pont was requested to supply expediting and inspection services for production equipment and consultant services for construction of the proposed arsenal at Denver.

Although Du Pont's design division was already heavily taxed with U. S. Government work, the company agreed to accept this new assignment, and on June 9, 1942, four days before the letter of intent was released, Du Pont representatives were in Huntsville, where initial procurement of production equipment for the three new arsenals was being carried out.

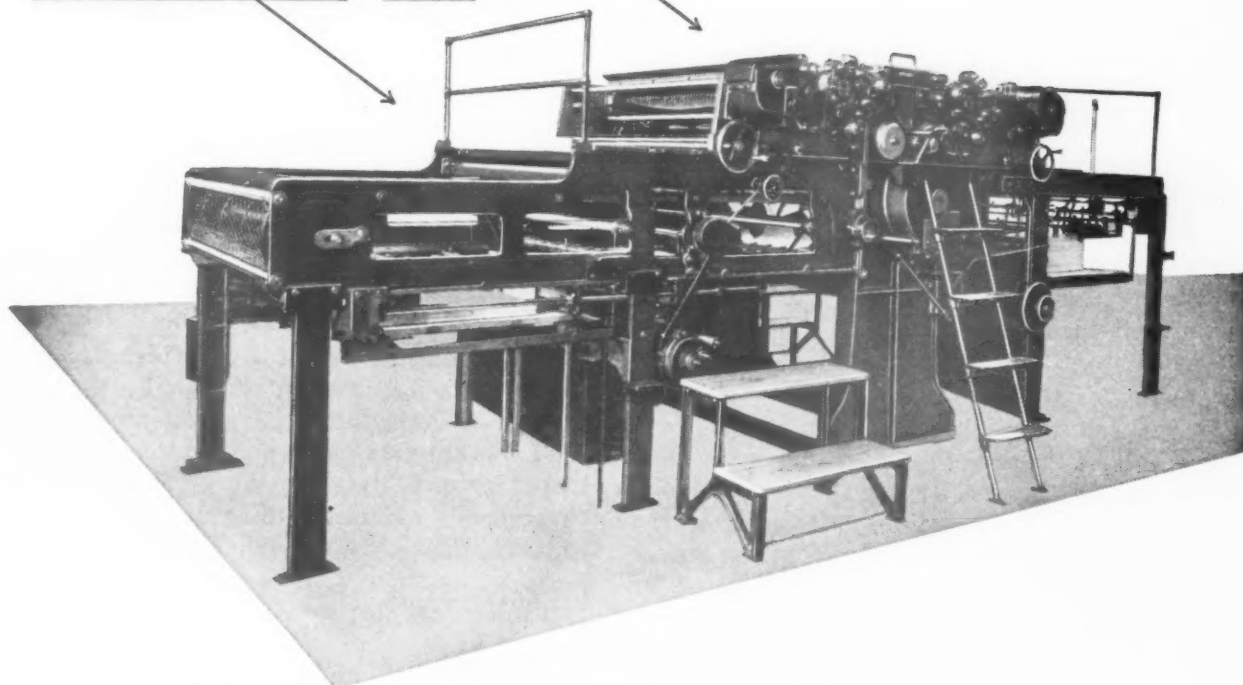
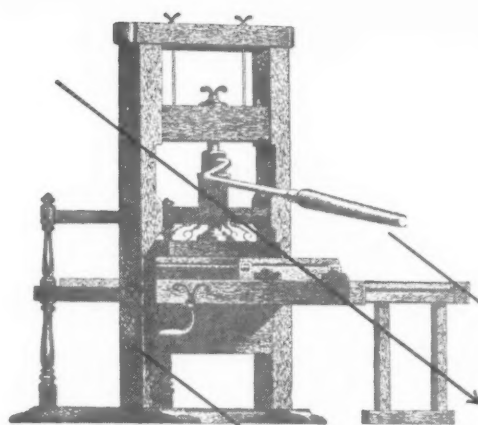
On June 15, 1942, design and field work started and on June 22 Du Pont opened offices at the plant site. After this date the Du Pont personnel who had been working at Huntsville transferred to Denver.

The M1 plant was originally scheduled to start operations by January 1, 1943, with completion of the arsenal scheduled for March 1, 1943. Early in December, 1942, however, it became evident that, under the sequencing of key orders, it would be impossible to meet these dates due to the urgency of orders for the synthetic rubber and high octane gasoline programs. Du Pont, being entirely responsible for the expediting of equipment, immediately notified CWS in Washington, adding that, unless directives for the manufacture of critical equipment could be obtained, the arsenal schedule would have to be set back. The requested directives never were obtained, but the first half of the M1 plant was ready for operation only slightly behind schedule and three weeks in advance of availability of raw materials for operation. Some equipment for the second half of the M1 plant was delayed considerably.

Production

The first HS was produced on January 1, 1943. A few days later, Maj. Gen. William N. Porter, Chief of the Chemical Warfare Service, visited the arsenal and was quoted in the *Denver Post*

(Continued on page 43)



mr. Daye showed the way

When Stephen Daye set up the first printing press in this country he pioneered an industry that is essential to every industry today. And the same basic principles he utilized in operating his original flat bed press are utilized in a vastly expanded way in modern high-speed, multicolored rotary presses. In producing for the first time in this country various electro-chemical products, Niagara also pioneered an essential industry . . . and has continually improved the quality and utility of its products. Thus Niagara is today . . . "An Essential Part of America's Great Chemical Enterprise."

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Army Day, 1948, Finds Chemical Corps in Strong Defense Role

Army Day is 20 years old in 1948.

Army Day was first advocated and established in 1928 by the Military Order of World Wars, under the auspices of Col. Thatcher T. P. Luquer, and was held on 1 May that year. The Military Order of World Wars is an organization of commissioned officers in both world wars, and their male descendants.

Although the first Army Day was held on 1 May 1928, it was fixed afterward as 6 April, the anniversary of the United States' entry into world conflict in 1917.

The celebration in 1928 will be the eleventh birthday of the official Army Day, set aside by Act of Congress and proclaimed by the President of the United States. It will be the twentieth in the annals of the Military Order of World Wars.

The theme adopted for Army Day in 1947, "A Strong America Is a Peaceful America," remains an ideal slogan. The public is deeply concerned over world peace and is disposed to look to their Army as a defender of that peace.

We can be certain that the next war, if there is one, will be even more of a "total war" than the one just past, and in trying to find an answer to the complex problem of security there are no easy solutions, no simple cures. What the future has in store for us can only be predicated by carefully weighing, one against the other, all the factors in the world situation today—economic, political, social, geographical and military.

The months since VJ-Day have driven home to us the truth that peace, like victory, costs dearly. Our period of relative immunity from world conflicts since the founding of this country is over. Two world wars have demonstrated beyond doubt that the United States must be defeated if any world aggression is to succeed. No future enemy will be foolish enough to attack us until it can see good chances of crippling our industrial potential before the shooting starts, by infiltration, sabotage and sudden attack.

The technique of the modern aggressor is the "sneak" attack and American industry stands out as a shining target for such a surprise attack. We must be ready with more deadly and advanced defensive and offensive weapons than any potential enemy. Next time we must be able to stand alone from the very beginning of such an attack—and win. If we do not maintain the strength to do this, we are simply inviting attack.

Our first President laid down this principle of national defense in his opening message to the Congress when he said, "To be prepared for war is one of the most effectual means of preserving peace."

You can be assured that the Army is working to maintain a strong, "prepared" America.

What is the role of the Chemical Corps? Its main effort is toward research and development. Too much stress cannot be laid on the importance and necessity of the peacetime research and development program. Many of the current research activities of the Chemical Corps cannot be disclosed for security reasons. However, its participation in the overall program as set forth in the unclassified version of the report of Research and Development Division, Department of the Army, for the fiscal year 1949, is as follows:

Chemical Agents

The following are projects which are now current or to be initiated in the fiscal year 1948 which will remain current in the fiscal year 1949:

Laboratory research and development and pilot plan process development on chemical agents; research work on the discovery and synthesis of new compounds of possible value as toxic warfare agents, together with the screening of candidate chemical agents; determination of the toxicity action of insecticides, rodenticides and repellents in the mammalian species; investigation of the effect of chemical agents on the growth of tissues; research on the synthesis of insecticides, rodenticides and repellents; the work on mildew-proofing agents in their application to Chemical Corps equipment; and further development in field equipment for prevention and treatment of chemical casualties. The work on protective devices, methods, procedures and techniques for defense against toxic chemical agents will be continued in the highest priority; and special emphasis will be placed on large-scale tests of toxic chemical agents, from the standpoint of defense, under all available environmental conditions.

The following is a summary of projects whose initiation in the fiscal year 1949 is contemplated:

Previous work on the synthesis, analysis and testing of toxic chemical agents has indicated the possibility that there may be toxic groupings, radicals, and linkages within the molecule which

are responsible for the toxicity of these molecules. Therefore, it is proposed to initiate basic research to determine, if possible, the underlying and basic principles of toxicity. A similar research conducted a number of years ago in the dye industry resulted in the determination of "chromophore" groups. This discovery expedited the development of the dye industry to its present advanced status. It is believed that in some measure "toxophore" formations may be found, the knowledge of which will similarly influence the development of toxic and super-toxic chemicals. It is further anticipated that similar investigations will be made in the fields of smokes and incendiaries.

It is anticipated that work on persistent and non-persistent toxic chemical agents suitable for use under all environmental conditions will be continued at an accelerated pace, and that the study of better weapons, munitions, and development on the protection of military personnel and civilian populations and materiel will continue to be made. Research and development will continue to be directed in the effort to perfect better chemical agents than now exist.

Research and development in this particular field is intended as a deterrent against the use of chemical agents by possible future enemies of the United States.

Incendiaries

Research work has continued on incendiary materials. Improvements are continuing to be made in mixing, filling and transfer equipment for the preparation and loading of incendiary materials in the field. Fundamental research on ballistics has been continued under research contract.

It is anticipated that large-scale tests will be made of developments in the field of incendiaries by the fiscal year 1950. It is planned that the effectiveness of developments in the field of incendiaries will be evaluated by engineering and field tests against other competing methods of warfare. It is also anticipated that protective clothing, equipment and measures will be sufficiently advanced for large-scale tests of their effectiveness against the known methods of incendiary warfare.

Flame Agents

Flame throwers made possible the destruction of enemy fortifications and the dislocation of the enemy from caves and otherwise inaccessible underground positions during the recent world war. Since the war, research and development have continued in the field of flame agents, and

on investigation of devices, munitions, methods and techniques for their offensive use. Work continues on the prevention and treatment of casualties from flame and incendiary weapons, also investigation and fundamental research in the production of flame.

Screening Agents and Smokes

The mixtures used during the recent war often produced smokes which caused nausea in battle-worn men. Since the war, new smoke producing mixtures and equipment have been developed up to the service test stage which are devoid of this nauseating effect. The development of plastic colored smoke fillings, superior to the present powder-type fillings used for signaling purposes, is far advanced.

Fundamental research will be conducted on all purpose screening agent.

Protective Equipment and Procedures

Since the war results of basic research have been applied in the development of better items of protective equipment and improved protective procedures. The all-purpose protective equipment poses problems of unusual difficulty, but marked progress has been made in this field during the period following the late war.

The problems connected with the development of protective clothing, equipment and procedures are unusually difficult, due to the fact that suitable protection must be furnished under all environmental conditions and that materials used must be compatible with those used for protection against other conditions and types of warfare. In addition to offering protection against toxicological warfare, clothing must offer protection against mildew, flame and conditions of extreme cold. Protective clothing, equipment and procedures must be developed which will afford the maximum protection of military personnel and civilian populations from the effects of all known toxic agents. It will be necessary to continuously initiate research and development in the field of protective clothing, equipment and procedures in order to cope with the indicated trend of future warfare.

Weapons and Munitions

In the light of present trends in warfare, new materiel will need to be devised and developed for those fields in which the Chief, Chemical Corps, has primary cognizance.

Miscellaneous Technical Operations

In support of the complete research and de-

(Continued on page 38)

BECCO PERACETIC ACID

40%

*A New Safe Bleaching
Agent for Fabrics Con-
taining Acetate Rayon*



PROPERTIES

Peracetic Acid CH_3COOOH	40% by weight
Active Oxygen as peracid	8.6% by weight
Specific Gravity	1.15 at 20°C.
Form	Colorless liquid—strong odor
Solubility	Similar to acetic acid

SUGGESTED USES

BLEACHING AGENT for alkali sensitive materials, and fats, oils and waxes.

CATALYST for bulk and emulsion polymerization

ENZYME INACTIVATOR

OXIDANT IN ORGANIC SYNTHESIS: Hydroxylation and epoxidation of olefinic double bonds; preparation of sulfones; ring splitting action on substituted benzene and naphthalene compounds (i. e. oxidation of phenol to muconic acid, of beta-naphthol to o-carboxycinnamic acid.)

STERILIZATION AGENT

AVAILABILITY

Becco Peracetic Acid 40% is now commercially available.

A FEW OTHER BECCO PRODUCTS

Hydrogen Peroxide in concentrations of 27.5%, 35%, 50% and 90% by weight.

Hydrogen Peroxide C. P., 30% by weight.

Calcium Peroxide, Magnesium Peroxide, Zinc Peroxide, Ammonium Persulfate, Potassium Persulfate, Urea Peroxide, Sodium Pyrophosphate Peroxide, Sodium Carbonate Peroxide, Acetyl Peroxide in dimethylphthalate.

Detailed description and laboratory samples of any Becco Active Oxygen Chemical will be sent on request.

BECCO SALES CORPORATION
AGENTS FOR BUFFALO ELECTRO-CHEMICAL COMPANY, INC.
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"Fire for Effect"

Notes on the Training and Combat Operations of the 90th Chemical Mortar Battalion

By LT. COL. EDGAR BELL, *CmlR*

The 90th Chemical Mortar Battalion was a lucky outfit. It got the "breaks," and not the least of these was the decision of the War Department to activate and train the battalion at Fort Bragg, N. C. This post was ably commanded by a fine general whose sole mission was to prepare troops for combat, and the general and his staff let nothing interfere with the accomplishment of that mission. Fort Bragg had splendid artillery ranges, training areas and facilities and the Field Artillery Board. The Board, from its President, Colonel Campbell, on down, was "mortar-minded." Its members loved the 4.2 chemical mortar and were fully familiar with its tremendous capabilities. The Board had conducted many tests on the mortar and its technique of fire and the results of all of its work were placed at the disposal of the battalion. The Board had assisted in the development of the M-59 sight and it loaned a pilot model of this sight to the battalion for training.

The battalion was activated on 10 February 1944, but fillers were not received until early in April. This long wait for fillers, while irksome at the time, later proved to have been another good break. At that period there was a dearth of training literature and material for 4.2 mortar battalions. FM 23-92 and TM 3-320 were not received by the 90th until after VE-Day. The battalion officers and cadremen were put to work to devise and publish our own training manuals covering the technique of mortar fire, mortar tactics, standing gun drill and other subjects not covered by available War Department manuals. These men did a thorough job. The problems were worked out step by step and before final approval each phase was tried out, using officers and cadre as trainees. These trials, before an experienced and highly critical "jury," uncovered and eliminated many bugs in the material. In addition to the training manuals, the officers and cadre worked out training programs, schedules, lesson plans and field problems. A gunnery school was initiated and it was rugged. Orders went down requiring that every officer, both line and staff, be graduated from this school or he could not accompany the battalion overseas. This school accomplished two missions—it taught gunnery and it made an easy out for officers who



LT. COL. EDGAR BELL, *CmlR*

did not desire to go overseas. There were a few of this sort with us for a short time. The gunnery school formed a mortar platoon of its students, requiring every officer and NCO to perform, in turn, every job in the platoon. Rank meant nothing. From dawn until dusk, and often later, the mortars were emplaced and displaced, dug in, fired in and dug out again. This field training and range practice taught our future instructors first hand knowledge of their jobs. Later, when they trained their own troops, these instructors knew what their men could do, should do and had to do. Moreover, the trainees had respect for and confidence in their instructors who could do any job asked of their men and could probably do it better. And, incidentally, this "pre-training training" gave the battalion commander a wonderful opportunity to weed out, which he did.

Perhaps the greatest achievement of the gunnery school was a by-product. From its inception, the school was encouraged to devise methods

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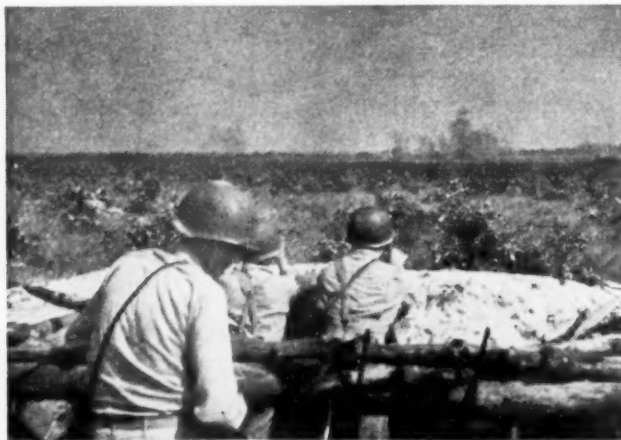
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which would increase accuracy, simplify operations or otherwise improve the technique of mortar fire. The group of young and enthusiastic officers hit upon the idea of firing from a constant elevation. The advantages of this system of fire were so great that the gunnery school was put to work first to prove the soundness of the theory, then to develop it. Constant elevation fire was established as a basic principle, and on this method the battalion developed a fire direction center control through which battalion fires were transferred and massed as in the field artillery. A simple and practical graphical firing table was devised and manufactured by battalion personnel. There is not sufficient space here to go into detail on constant elevation fire. The system proved itself in combat as all of the battalion's missions were fired through the company FDC, using constant elevation with tremendous effect.

By orders of Army Ground Forces, the MTP training was reduced from 13 weeks to 8 weeks on the grounds that all of our men had all received individual training in other units. This was true, too true. Most of our fillers were men who had been dropped at POE as cripples—mental, moral or physical. They were the rejects and many of them had been through basic training twice or more. The struggle to rehabilitate or transfer these cripples was terrific and it lasted throughout our training. We were obliged to do the best we could with what we had, so train them we did, and it was amazing what fine soldiers could be made from the castoff men of other units. The valid cripples were not relieved until the week of our departure for POE, and the night before we left we received some 90 replacements, none of whom had ever seen a mortar fired.

The fillers arrived on Saturday, 1 April, and MTP training started off full blast the following Monday. We had much to teach and more to



Range at Ft. Bragg, 1944
HE FIRE



Range at Ft. Bragg, 1944
"Elevation 900"

learn. From the first formation that morning, we tried to follow these principles:

1. To develop and to maintain discipline; cheerful, willing, eager.
2. To teach the soldier full knowledge of his weapons; the tools of his trade.
3. To condition our men, physically and mentally, for combat.

We trained thoroughly. I have always felt that it is better to teach a soldier the bare fundamentals, and to teach them well, than it is to give him a smattering of many things and a thorough knowledge of none.

Small arms training was given a great deal of attention. Regulations required that a soldier be qualified with his assigned weapon and fire familiarization with other unit small arms. This is good theory but poor practice because marksmanship comes up early in the MTP and long before the unit commanders have permanently assigned their men. And as a result, men who have qualified with a carbine are usually assigned to a TO&E job which rates an M-1 rifle. To overcome this difficulty I ordered that every man in the battalion be qualified with both M-1 rifle and carbine and on transition as well as known distance ranges. One hundred percent qualification is a very difficult achievement, but it can be done. It takes a good deal of hard work, inspired instruction, and ammunition. Fortunately the latter was plentiful in May 1944. Every Saturday afternoon and Sunday was a range day for some of our units or groups of "dodos." We did not quite gain our goal, but every man was qualified with one weapon and over 95 percent were qualified with both before our ammunition allowances were expended.

Night training was started early in the MTP and increased greatly during the UTP. It was

a rugged go but well worth the effort. Much training was conducted in the field. Our battalion never got "barracks-bound." In night training it was our aim to accustom our men to perform every sort of operation in darkness. Night marches by foot and by motor were stressed. There was much practice in moving into a position area, setting up mortars and "dry-firing" problems all in the pitch black nights of Fort Bragg's "jungle" areas. Later "live" problems were fired at night with excellent results. By the middle of UTP practically all training was conducted in the field. The battalion left its area on Monday morning and stayed out until Friday noon, and field training was conducted day and night. Realism was the keynote of all field work. Troops were in the "combat zone" during the entire period and woe betide the men who forgot that fact. The field firing problems were progressive and advanced from one phase to the next. Critiques were frequent so that all the men from the "yardbirds" on up were made familiar with the problem and its execution, the good points and how to better them, and the faults and how to correct them. The night training and field training were far in excess of the requirements of the MTP and UTP, but if I ever have another battalion to train I would try to give it twice as much night and field work. This rough grind really separates the men from the boys. Unit commanders made permanent assignment of personnel after a long, gruelling tour of field duty, and later in combat they proved the wisdom of their selections. We broke very few NCO's and officers overseas.

Mortar fire was the battalion's meat. We loved it. Ammunition allowances were all that kept us from firing more than we did. Even in this respect we fared better than we had ever hoped. The Field Artillery Board requested us to fire



Detector CU, 90th Chemical Mortar Bn., Kobergerstrasse, Nurnberg

many test problems for them, which we were happy to do, using their ammunition. We also fired some rather large "shoots" for two infantry divisions for which we received special allowances of shells.

Field firing was not conducted exclusively by officers. All platoon sergeants and squad leaders were required to fire platoon problems and many of them fired company problems. This idea paid off in action. Many of our sergeants were as fine gunners as any officer in the battalion.

Company firing through its fire direction center was stressed. I felt then and always will feel that the mortar company, not platoon, is the tactical unit. The fire of the company's three batteries was transferred and massed, and much emphasis was placed on this phase of training. On two occasions, the fire of the entire battalion, 48 mortars at that time, was massed. One show was put on at Fort Bragg for the Field Artillery Board and the C. G. and Staff of the 100th Infantry Division. Company FDC's were set up and tied into the battalion FDC. Colonels Wages and Montgomery of the FA Board designated targets and called for massing and transfers. The grand finale of the show came when Col. Wages called for TNT fire by the entire battalion on a pillbox target. It was perfect and the effect of 48 rounds of TNT crashing in on a tiny area with one huge roar was most impressive. Later we massed the battalion in a long smoke screen problem at Fort Fisher, N. C. These battalion shoots did much to sell the mortar to all observers

and they were of tremendous aid to us in building high morale and fine teamwork.

Training at Fort Bragg came to an end with corps and AGF tests and we plunged into POM. This was barely completed when we left for port and sailed to England. Here we became acquainted with British weather and British beer, collected our equipment and got in a few more licks at training, mostly night work in RSOP and physical conditioning. In England the battalion was reorganized on the new TO&E providing for three firing companies of 12 mortars each and a real ammunition train. Finally we left for the far shore and after a few days in a horrible camp in France we joined the first U. S. Army near Aachen.

Combat Operations

The battalion was attached to the XVIII AB Corps for a few days, then attached to the III Corps and we stayed with this Corps for the rest of the war, moving with them from campaign to campaign and from army to army. Along with such fine outfits as the 14th Cavalry Group we became "household troops" of the III Corps, and this was most fortunate. III Corps was ably commanded by one of the finest generals in the business and he had a splendid staff. Col. Kenneth Cunin, Chemical Officer of the First Army, who was a real mortar man, and Col. George W. Wannamaker, Chemical Officer of III Corps, were most helpful to us.

The greatest fortune of all befell the battalion when we were initially committed to action in direct support of the 1st Infantry Division and the 82nd AB Division, the latter being relieved in a few days by the 9th Infantry Division. These fine seasoned outfits, the best in the ETO, took us right under their wings and with their able guidance we became battlewise very quickly and very cheaply. They used us and they used us hard but correctly. These divisions were great exponents of night fighting and here our training stood us in good stead. And when they attacked, they threw the works, employing every ounce of fire power. We fired countless missions for them and our work was good.

We spent some weeks in the Hurtgen Forest while the First Army wound up for an all-out attack across the Roer River. Our own Company B fired its first big mission, screening the bridge crossing of the 8th Infantry Division. It was a difficult firing problem, beautifully accomplished and roundly applauded. Then, in direct support of the 1st and 9th Infantry Divisions, we made an assault crossing of the Roer River,

fought across the Cologne Plain, crossed the ERFT and were hammering at Cologne, Bonn and Bad Godesburg when CCB of the 9th Armored Division caught the bridge at Remagen. That day the 9th Infantry Division accomplished the most difficult and probably the most brilliant tactical operations of the war. When the news of the bridge came through, the 9th Infantry Division was locked in a bitter fight against well-emplaced and ably-led German troops in defense of Rhine River crossings. In the middle of this hard fighting the 9th Infantry Division broke contact, withdrew and infiltrated south to Remagen, crossed the Ludendorf Bridge and held the bridgehead. It does not detract one whit from the honor of the 9th Armored Division to state that the 9th Infantry Division alone held the bridgehead, thereby saving thousands and thousands of lives and shortening the war by six months.

The 90th Chemical Mortar Battalion played no small part in this affair. Company C crossed the bridge with the leading CT of the 9th Infantry Division. The battalion set up a FWD CP and a couple of days later brought over Companies A and B. All companies did fine work, but the greatest glory went to Company C. On the night of 10-11 March their mortars broke up three strong counterattacks all supported by tanks. Had any of these been successful, the bridgehead would have collapsed. That night we really sweated it out. When we suspended fire after the last mission we were firing at 1,250 yards and had exactly 3 rounds per mortar on position. At dawn Staff Sgt. "Pop" Grenier arrived with two ammunition truckloads of HE shell. I could have kissed him; in fact, I did.

After that night the bridgehead forces built up rapidly. Resistance was very tough but the 9th Infantry Division punched a hole and our armor got loose. General Hodges made his famous end run known as the Ruhr Encirclement and the German army was trapped. The battalion supported the 9th Infantry, 5th Infantry and 99th Infantry Divisions in operations liquidating the Ruhr Pocket. Some of the fighting was very bitter, particularly on the east side of the pocket where the Krauts made desperate efforts to break out. Here the good old 9th Infantry Division, with liberal doses of 4.2 mortar fire, discouraged their efforts. In this fighting Lt. Andriolli's platoon of Company C broke up an attack with 20 rounds of HE and 20 rounds of WP at 1400 yards in 3 minutes. The mortars knocked out two tanks and we counted 61 dead and took 104 prisoners. Quick, accurate work on

(Continued on page 39)

Alaskan Outpost



Colonel Ludlow King, President, recently spent a month on military exercises in remote parts of Alaska. At Fairbanks he took time out to form the Northern Outpost of the Chemical Corps Association. The above picture shows him signing up Captain Cornelius M. Schmelzle as a new member in our Association. The men in the picture above, from left to right, are: Captain Schmelzle, Colonel King, Charles C. Comstock, Manuel P. Comulada, George J. Oakley, Fred B. Shaw, Jr., and Toivo E. Puro.

* * * *

PROFESSIONAL DIRECTORY

* * * *

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New Category System for Non-Regular Officers

Changes affecting extended active duty tours for civilian component officers now on duty with the Army and those to be called to extended active duty in the future have been announced by the Department of the Army.

The changes, which became effective on 1 March, modify the present category system for retention of non-regular officers on active duty formulated shortly after the end of the war. They introduce maximum age limits for those now on active duty as well as for calls to extended active duty for Reserve and National Guard officers. They also establish fixed time periods for length of tours.

"The officers of the civilian components on extended active duty continue to be an essential part of the officer corps of the Army of the United States," the Department of the Army stated. "In fairness to these officers, the Department of the Army recognizes that a frank statement of its policy and position should be made. As long as present commitments exist, there will be a need for a large number of civilian component officers on active duty.

"The Department of the Army is redefining its tours of extended active duty in order that it and the individual officer will have a better understanding of their commitments to each other. However, it must always be recognized that progressive retrenchment and reduction in force, accompanied by possible readjustments in grade, may be required. When such reduction becomes necessary, the best qualified officers will be retained. A civilian component officer of appropriate age in grade may, therefore, plan on remaining on extended active duty for some years if he maintains a high standard of efficiency and personnel requirements, budgetary limitations and ceiling permit the retention."

Three new categories have been established. Only the present Category V, which includes officers now on active duty who desire to return to civil life at the earliest opportunity, remains unchanged. All qualified officers now on duty who wish to sign new category statements must submit their applications on or before 30 April. The category selected, however, must be for a period that will expire prior to the time the applicant will reach his maximum age in grade.

Category I provides for a one-year period of active duty and is open to Medical Department officers, other than those of the Medical Service Corps, and to officers now on active duty who are able to complete one year's service, but not a two or three-year category by virtue of age.

Category II calls for a two-year period of duty and eligible applicants include Officer Candidate School graduates commissioned subsequent to March 1, 1948; officers on competitive tours for appointment in the Regular Army; Medical officers other than those of the Medical Service Corps; and officers now on active duty who cannot apply for a three-year category because of age limitations.

Category III, comprising a three-year tour, may be elected by qualified civilian component officers now on active duty and who will not reach the maximum age in grade prior to the termination of the category commitment.

To be eligible for active duty in any of the new categories, applicants must hold a Reserve commission dated subsequent to June 28, 1945, or a National Guard of the United States commission.

The new maximum ages in grade apply to all non-regular officers except those of the Chaplains Corps and the Medical Department other than the Medical Service Corps. Top age in grade for warrant officers is 55 years. The maximum ages for officers from second lieutenant to colonel in order to continue on active duty are as follows:

Second Lieutenant	35 years
First Lieutenant	40 years
Captain	45 years
Major	50 years
Lieutenant Colonel	55 years
Colonel	60 years

Officers of the Women's Army Corps are not affected by the category changes since they cannot be assured of continued active duty until such time as proposed legislation authorizing their appointment in the Organized Reserve Corps is enacted.

Calls to extended active duty of Reserve and National Guard officers now in civil life will be utilized by the Department of the Army to maintain the officer strength to accomplish its assigned

mission. Tours of duty will normally be of three years' duration and on a voluntary basis. However, tours of one and two years' duration are authorized for officers of specialist nature.

Reserve and National Guard officers applying for tours of active duty will not have reached the birthday anniversary indicated below for the grade in which eligible upon entering extended active duty:

Warrant Officers	45 years
Second Lieutenant	30 years
First Lieutenant	35 years
Captain	40 years
Major	45 years
Lieutenant Colonel	50 years
Colonel	52 years

Reserve officers on inactive status requesting active duty tours apply direct to The Adjutant General, Washington 25, D. C. National Guard officers forward their applications through The Adjutant General of their State. At the present time, however, only a limited number of vacancies exist. These are all in company officers' grade and in military specialties.

DISCHARGE CERTIFICATES

The United States Army henceforth will issue Discharge Certificates to officers being discharged from the service instead of the Certificates of Service formerly used. The new certificates will be uniform for all branches of the Armed Forces and are the result of a recommendation by a joint committee from the Army, Air Force, Navy, Marine Corps and Coast Guard that met in 1947 to draw up uniform discharge regulations for officers of all the Armed Services.

The Honorable Discharge Certificate will be identical in appearance with that issued to enlisted men. In addition, there will be a General Discharge Certificate and a Discharge Certificate for issue, depending upon the circumstances under which the officer is separated from the service.

The new Discharge Certificate will not be given to officers relieved from extended active duty who hold commissions in a Civilian Component. Instead, these will receive a Certificate of Service covering their period of active duty and will be issued a Discharge Certificate only when their connection with the Army is completely terminated.

Since the new certificates will not be issued retroactively, the Certificate of Service given to

separated officers in the past will not be replaced by the new form.

In July of 1947 the Army, along with the other services, adopted uniform discharge procedures for all enlisted personnel. These insure that an enlisted man discharged from any service will receive the same form of discharge for a similar reason, thus eliminating numerous inconsistencies and injustices that may have occurred under the former procedures.

OVERSEAS SERVICE BARS

Pending the printing of changes in AR 600-40, 31 March 1944, paragraph 55g (1) of those regulations is changed to read as follows:

"(1) One overseas service bar is authorized for wear for each period of 6 months' active service as a member of the Army of the United States (including the Women's Army Auxiliary Corps) outside the continental United States from 7 December 1941 to 2 September 1946, both dates inclusive. Alaska is outside the continental limits of the United States. An overseas service bar is NOT authorized for a major fraction of a 6-month period." (Example: An individual with a total overseas service of 17 months 16 days is authorized to wear only 2 service bars.)

AWARD TO ED TREACY



Edward D. Treacy, 666 West 207th Street, Manhattan, receives from Major General Alden H. Waitt, Chief, Chemical Corps, U. S. Army, an official commendation for meritorious civilian service and outstanding performance of duty. Mr. Treacy, a sergeant with the Chemical Corps during World War II, is a member of Shamrock Post, Catholic War Veterans, Inwood, New York City. The commendation was presented at the headquarters of the N. Y. Chemical Procurement District, 111 East 16th Street, Manhattan.

Report of Research & Development

By W. R. KIRNER, *Chairman*

The Chemical Corps Association Research and Development Committee for 1947-1948 is composed of the following individuals:

Dr. R. W. Cairns, Hercules Powder Company.
Dr. Charles S. Keevil, Arthur D. Little, Inc.
Dr. W. A. Lazier, Southern Research Institute.
Dr. Charles Wirth III, E. I. du Pont de Nemours and Company, Inc.

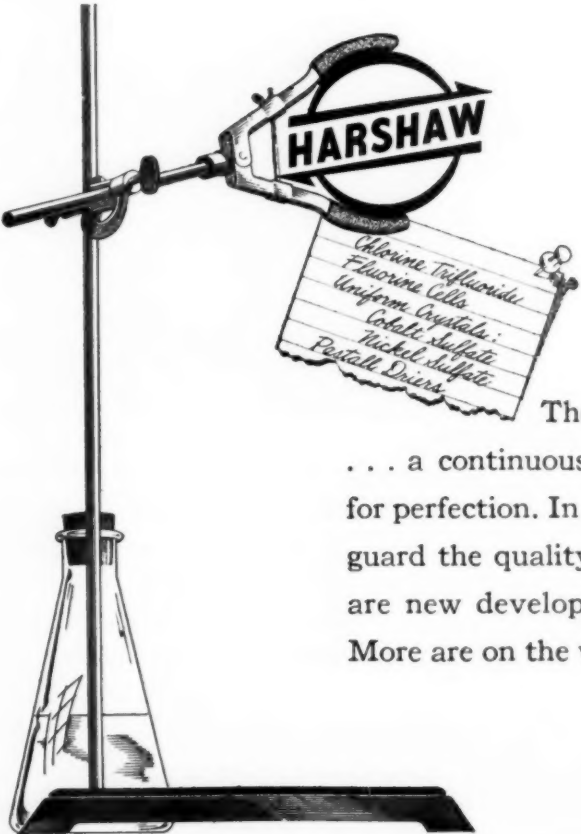
Last fall letters were sent to the chairmen of all of the Chapters requesting them to appoint a local Research and Development Committee. To date the following chapters have responded and have appointed such committees with the following designated chairmen:

Chicago, Ill.—Dr. John O. Hutchens.
Cleveland, Ohio—Mr. R. B. Schaal.
Camp Detrick, Md.—Dr. Charles R. Phillips.
Hawaii—Capt. Robert C. Arbuckle.
Pittsburgh, Penna.—Mr. John F. Matejczyk.
San Francisco, Cal.—Dr. Philip Leighton.

Washington, D. C.—Mr. Ralph T. Norman.
Philippines—Lieut. W. S. Peterson.

About sixteen chapters still remain to be heard from so that at present only about one-third of the chapters, to our knowledge, have appointed research and development committees. It is hoped that chairmen of chapters not listed above who may read this report will promptly notify the National Headquarters office of the name of the appointee as chairman of the local research and development committee.

It is proposed to have a meeting of the Research and Development Committee in Chicago during the meeting of the American Chemical Society in April. At this meeting plans will be formulated for Chemical Corps Association research and development activities which will later be communicated to the chapter committees. In the interim the Research and Development Committee will welcome any ideas or suggestions proposed by members of the Association which concern matters of research and development of interest to the Chemical Corps.



symbol of progress

The Harshaw trademark symbolizes progress . . . a continuous search for new principles . . . a striving for perfection. In addition it is a reminder that we vigilantly guard the quality of our chemicals. The items listed above are new developments recently announced by Harshaw. More are on the way . . . research at Harshaw is continuous.

THE HARSHAW CHEMICAL CO.
1945 E. 97th Street, Cleveland, Ohio
BRANCHES IN PRINCIPAL CITIES

Chemical Corps Extension Courses

Good extension courses are now available for all ranks of Chemical Corps officers. Here is the story: The Prospectus of Extension Courses of the Chemical Corps School lists a total of 131 subcourses in six series. Of these, the Chemical Corps School will prepare 51. The following tabulation shows the responsibility of the Chemical Corps School for preparation of subcourses, broken down by series.

Preparing Agency	Series						Total
	10	20	30	40	50	60	
CmlC School	2	8	15	18	3	5	51
Other Schools	16	10	11	11	1	1	50
C&GSC	—	—	—	—	16	14	30
Total	18	18	26	29	20	20	131

There is no planned specialization for 10 and 20 series students. Subcourses above the 20 series in the extension course program of the Chemical Corps are designed for specialized training of one or more of the following training groups: A. Troop and Staff; B. Technical, Manufacturing, and Inspection; C. Supply and Procurement. The Chemical Corps School administers the following subcourses for Chemical Corps officers and enlisted men: all subcourses through the 40 series, whether prepared by the Chemical Corps School or other schools; and subcourses in the 50 and 60 series, other than those conducted by the Command and General Staff College at Fort Leavenworth, Kansas. Subcourses prepared by other schools are included in all series so that every officer may become familiar with basic subjects and also learn the tactics and techniques of the other arms.

Subcourses for the Chemical Corps are prepared by the Publications and Extension Course Division, Chemical Corps School. This division consists of the writing branch, the illustration branch, and the extension course branch. The preparation of a subcourse requires many stages with varying times required for each stage. First, a writer, either military or civilian, is assigned to a subcourse based upon his education, experience, and aptitude. He performs research on the subject according to the approved scope of the subcourse and prepares titles and scopes for each lesson. After approval of the subcourse breakdown by the chief of the writing branch, the writer prepares the lessons, including exercises and their solutions together with planning illustrations and tables. Any necessary art work such as illustrations, maps, and overlays are pre-

pared by the illustration branch in accordance with the suggestions of the writer. Although the process to this stage may appear routine, with the development of new techniques and promulgation of new doctrine, the writer may find available texts inadequate or outmoded. When new or additional reference material is required, it may be made available for the student by three methods: (1) An attached memorandum may be written for one or more lessons to clarify or supplement available texts, (2) a special text may be written for the entire subcourse, or (3) a tentative field or technical manual (revision draft of existing manual or review draft of proposed manual) may be published. Proper coverage of the subject material may require a combination of methods. The solutions or the method of solution for each exercise must be covered in the text material furnished the student with the subcourse. The writing style employed endeavors to create a feeling of informality. In exercises or requirements which are preceded by a situation, writing is in the second person.

A subcourse introduction is combined with the first lesson and serves as a general orientation for the entire subcourse. It includes scope of subcourse, relationship of subcourse to previous and future subcourses, titles of each lesson, and a list of texts and materials furnished indicating which texts the student may retain.

The following types of exercises are employed: Multiple choice, true-false, completion, matching, essay, map exercises, and computations. To minimize students' work, the exercises are printed directly on the answer sheet with space allowed for student solutions.

The solution sheet consists of four sections or less, depending on the exercises:

Section I—A Solution. Lists acceptable answers, with text references.

Section II—Discussion. Methods used in arriving at certain solutions, particularly in exercises involving computations or tactical decisions.

Section III—Comments. Check list of likely errors to simplify grading.

Section IV—Cut Sheet. Itemization of deductions for each comment in Section III to allow partial credit and to provide uniformity in grading.

Sections I, II, and III are printed on blue paper and sent to students after satisfactory completion of a lesson. Cut sheets and all examination solutions are printed on pink paper and are retained in the extension course branch for use by graders only.

When the writer has completed and checked the draft of the subcourse it is typed, approved, and submitted for an expert test to a member of the school faculty, a member of another post activity, or anyone qualified on the particular subject. The expert reviews the subcourse in general, each lesson in particular, and text material for compliance with established scope and adequate coverage of the subject. Pertinent comments are incorporated by the writer. The subcourse is then edited for factual consistency, form, style, and technical accuracy; and a review draft is prepared. The review draft is submitted for approval through Chief, Chemical Corps, to Headquarters, Army Ground Forces. In order to provide a preview of student reaction, especially in regard to completion times and instructional merit, the review draft is subjected to a nonexpert test by military personnel of the school and a grader of the extension course division. Any problems that arise are taken up with the writer.

Of special interest is the time required by the nonexperts for completion of each lesson. If too long a time is required for the credit allowed, changes or modifications must be made to have the over-all credit of the subcourses agree with the credits listed in the prospectus. After approval by Army Ground Forces and Chief, Chemical Corps, and incorporation of their comments, the subcourse is put in final form by the writer, is edited, and prepared for printing.

Printing is accomplished by photo-offset process by the Certified Duplicating Unit, Chemical Corps School. The necessary steps in preparing reproducible copy include: Typing on electro-matic (carbon paper ribbon) typewriter, proof-reading with editor, preparation of final art work, layout of each lesson, preparation of printer's dummy, and a final check for accuracy and completeness before delivery.

All copies of the printed subcourse along with other printed materials required for students are delivered to the extension course branch. Copies are sent to certain authorized agencies for file and reference.

Individual lessons or entire subcourses are revised or supplemented when texts on which they are based are revised or when errors are noted. Subcourse examinations are revised when it is

determined that the solutions have been compromised.

The preparation of Army Extension Courses is a continuing job. The effort expended in man hours is large and expensive. It is hoped that this means of providing inactive duty training and a military education for reserve and national guard officers, who comprise 90 percent of our officer strength upon mobilization, will be used by them so that they will be as well grounded as possible to fill their mobilization assignments.

WILMINGTON CHAPTER

Our first 1948 gathering was a dinner meeting taking place on Wednesday evening, February 11 at which twenty-five members were present. We were fortunate enough to have as guest speakers for this evening, Joseph C. Prentice, Lt. Col., Office of Chief of Chemical Corps, whose subject was "Affiliation Program as it Affects the Chemical Industry," and George E. Danald, Major, Chemical Corps, who spoke on "Army-Industry Cooperation in Research and Development." Both talks were very interesting and appreciated by the members present. We were also pleased to have as guests of the meeting, Robert W. Rothrock, Col., Chemical Corps, and W. Rothrock, Capt., Chemical Corps, both of whom gave short informal talks and answered questions pertaining to the cooperation program.

Preceding the speeches, a short business meeting was held at which Chapter officers for the ensuing year were elected and nominations made for Chapter candidates for Delegates-at-Large. The following men were the choice of officers for the coming year:

R. T. Yates, President
C. D. Pratt, 1st Vice President
W. E. Catlin, 2nd Vice President
H. S. McQuaid, Secretary-Treasurer

Walter E. Lawson was selected and agreed to become the chapter's candidate for delegate-at-large.

Our immediate future activity will be another dinner meeting on Thursday evening, April 1. Arrangements for this occasion are currently in the making with an excellent guest speaker program expected.

H. S. MCQUAID, *Secretary*

Annual Meeting—May 20-21-22

In order that the Edgewood Chapter may make the necessary arrangements, it is essential that your reservation be in our hands not later than April 29. **DO NOT DELAY.** Tear off and mail today. Meet your old friends. Interesting tours of manufacturing and research operations will be available. The demonstration should be better than last year.

PROGRAM—20 May 1948

Registration for "Early Birds" and impromptu activities, probably centering around the clubs.

21 May 1948

8:00-12:00—Registration and interim activities

12:00- 1:00—Lunch

2:00- 4:00—Demonstration

5:00- 7:00—Cocktail Party

7:00- 9:30—Annual Dinner

10:00- 1:00—Dancing and nightclub type party

22 May 1948

9:00-10:00—Directors' meeting and election of officers

10:00-12:00—Annual Association business meeting

The Chemical Corps Association

ROOM 523, 1129 VERMONT AVE. N.W.

WASHINGTON 5, D. C.

GENTLEMEN:

I will attend the 3rd Annual Meeting of the Chemical Corps Association to be held at Army Chemical Center, Md., on May 20, 21 and 22, 1948. Please enter my reservation for the following:

- | | | | |
|-------------------------------------|---|-----------|---------------------|
| <input type="checkbox"/> | Billet, Thursday, May 20 | \$1.00 | |
| <input checked="" type="checkbox"/> | Breakfast, Friday, May 21 | 1.00 | TIME |
| <input checked="" type="checkbox"/> | Lunch, Friday, May 21 | 1.00 | 12:00 to 1:00 P.M. |
| <input type="checkbox"/> | Demonstration, Friday May 21 | No charge | 2:00 to 4:00 P.M. |
| <input checked="" type="checkbox"/> | Mixer, Friday, May 21 | 1.50 | 5:00 to 7:00 P.M. |
| <input type="checkbox"/> | Dinner, Friday, May 21 | 3.50 | 7:00 to 9:30 P.M. |
| <input type="checkbox"/> | Dance and entertainment, Friday, May 21 | .50 | 10:00 to _____ P.M. |
| <input type="checkbox"/> | Billet, Friday, May 21 | 1.00 | |
| | (Unless occupied on Thursday night, in which case no additional charge) | | |
| <input type="checkbox"/> | Breakfast, Saturday, May 22 | 1.00 | |
| <input type="checkbox"/> | Lunch, Saturday, May 22 | 1.00 | |

I will arrive at Army Chemical Center _____

☐ I desire sleeping accommodations for my wife _____

I plan to leave Army Chemical Center _____

Mail to arrive not later than April 29, 1948.

Name _____

Address _____

Chapter _____

Join the CHEMICAL CORPS ASS'N

★ WHAT THE ASSOCIATION DOES:

The members of this Association, mindful of the vital importance of chemical warfare in the field of national defense, have joined together as a patriotic obligation to preserve the knowledge derived from their war experiences and to encourage improvements in science as applied to the Chemical Corps. The objects of this Association, therefore, are to sponsor new developments designed to increase the efficiency of chemical warfare means, to collect and disseminate useful knowledge with respect to chemical warfare and related subjects, to foster a spirit of good will and cooperative endeavor among its members and with industry, and to perpetuate the friendships, memories and traditions growing out of their service with the Chemical Corps. The members of this Association and its constituent local Chapters are mutually pledged to the furtherance and promotion of these objects.

★ WHO IS ELIGIBLE FOR MEMBERSHIP:

Any person who is or may be assigned or detailed to duty with or in the Chemical Corps, whether as officer, warrant officer, enlisted man or civilian employee, or who has been honorably discharged from such duty, and any person interested in the promotion of chemical warfare preparedness for national defense, may upon approval of the Executive Committee and payment of the annual dues hereinafter specified become a Regular member of this Association.

DO IT NOW!

If you are not now a member, fill in this application and mail it today.

TO: FRED M. JACOBS, Secretary, Chemical Corps Association
Room 523, 1129 Vermont Ave. N.W., Washington 5, D. C.

I hereby apply for membership in the CHEMICAL CORPS ASSOCIATION. Inclosed herewith is check or money order in the sum of:

Regular membership \$5.00 ☐

Student membership \$2.50 ☐

Group membership \$100.00 ☐

Life membership \$100.00 ☐

Of the sum remitted for dues, \$2.00 is for the annual subscription for the Chemical Corps Journal, and \$.50 is for the annual subscription for the Chemical Corps News.

I am a citizen of the United States of America with a deep sense of the obligation of every citizen to devote himself unstintingly to the cause of our nation's defense whenever the need arises. I have a particular interest in the Chemical phase of national defense.

Military affiliation or CWS activity, if any, in World War II _____

Name _____

Address _____

City _____

ELECTION OF DIRECTORS AT LARGE FOR YEAR 1948-49

Pursuant to Article V, Section 4, of the Constitution of the Chemical Corps Association, the term of office of the present 20 Directors-at-Large of the Association expires at the annual meeting of the Association to be held at Edgewood, Maryland, on May 20, 21 and 22, 1948, and it is further provided that their successors shall be elected by the general ballot of the members of the Association. The Executive Committee has canvassed the Association and solicited nominations for Directors-at-Large for the year 1948-49 and the names of those nominated, with identifying information, are listed on the ballot appearing below. It is requested that you vote for 20 of the names listed thereon and mail the ballot to the office of the Association, Room 523, 1129 Vermont Ave. N.W., Washington 5, D. C., on or before May 10, 1948. Ballots showing a postmark subsequent to that date will not be counted. Indicate your vote by placing an X in the square opposite the nominee's name. Members of the Association desiring to vote for a person who has not been nominated may do so by writing in his name on the line provided for that purpose on the ballot. Ballots showing less than 20 names voted for will be counted. However, ballots showing more than 20 names voted for will be declared invalid and will be disregarded.

BALLOT

- | | |
|--|--|
| DR. IRA L. BALDWIN <input type="checkbox"/> | L. WILSON GREENE <input type="checkbox"/> |
| Dean, Department of Agriculture, University
of Wisconsin, Madison, Wis. | Scientific Director, Chemical Corps Technical
Command, Army Chemical Center, Maryland |
| Nominated by Pine Bluff Chapter
Camp Detrick Chapter
Dist. of Columbia Chapter | Nominated by Edgewood Chapter |
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| Diamond Alkali Co., Painesville, Ohio | Pemco Corporation, Baltimore, Md. |
| Nominated by Cleveland Chapter | Nominated by Baltimore Chapter |
| R. E. CECIL <input type="checkbox"/> | WILLIAM J. HARSHAW <input type="checkbox"/> |
| Scaife Co., Oakmont, Pa. | President, Harshaw Chemical Co., Cleveland O. |
| Nominated by Pittsburgh Chapter | Nominated by Pine Bluff Chapter
Cleveland Chapter
Dist. of Columbia Chapter |
| C. D. CLAWSON <input type="checkbox"/> | DR. JULIUS HYMAN <input type="checkbox"/> |
| Ferro Enamel Corp., Cleveland, Ohio | President, Julius Hyman & Co., Denver, Colo. |
| Nominated by Cleveland Chapter | Nominated by Rocky Mountain Chapter |
| CLARENCE W. CROWELL <input type="checkbox"/> | S. WILLARD JACOBS <input type="checkbox"/> |
| Germicide Corp., Rochester, N. Y. | Vice President, Niagara Alkali Co., N. Y. C. |
| Nominated by Pine Bluff Chapter
Rochester Chapter
Buffalo Chapter
Dist. of Columbia Chapter | Nominated by Pine Bluff Chapter
Dist. of Columbia Chapter |
| G. W. DOLAN <input type="checkbox"/> | V. R. JACOBS <input type="checkbox"/> |
| President, Mathieson Alkali Works, N. Y. C. | Goodyear Tire & Rubber Co., Akron, Ohio |
| Nominated by New York Chapter | Nominated by Cleveland Chapter |
| DR. WILLARD H. DOW <input type="checkbox"/> | DR. H. F. JOHNSTONE <input type="checkbox"/> |
| President, Dow Chemical Co., Midland, Mich. | Department of Chemistry, University of
Illinois, Urbana, Ill. |
| Nominated by Pine Bluff Chapter
Huntsville Chapter
Dist. of Columbia Chapter | Nominated by Pine Bluff Chapter
Edgewood Chapter
Dist. of Columbia Chapter |
| GEORGE B. DRYDEN <input type="checkbox"/> | DR. D. B. KEYES <input type="checkbox"/> |
| Chairman, Executive Committee, Sheller
Manufacturing Co., Chicago, Ill. | Director of Research, Heyden Chemical Co.,
New York, N. Y. |
| Nominated by Pine Bluff Chapter
Chicago Chapter
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| ROBSON ENGLISH <input type="checkbox"/> | SIDNEY D. KIRKPATRICK <input type="checkbox"/> |
| President, English & Lauer, Inc., Los Angeles | Editor, Chemical Engineering, New York, N. Y. |
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of Technology, Pasadena, Calif.
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Co., Azusa Plant, Azusa, Calif.
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Chapter.....

German Smoke Pot Projector for Armored Vehicles

By GEORGE E. MILES¹ and L. WILSON GREENE²
Chemical Corps Technical Command
Army Chemical Center, Maryland

The major tactical use of the smoke pot projector mounted on German armored force vehicles was to provide a smoke screen to protect the vehicle from hostile fire in a withdrawing operation. It could be used also for local smoke missions and for filling in gaps in large area screens, and to screen the advance of an armored column.

The German device consists of two major components, the smoke pot and a three-barrel projector with accessories. The following description is taken from reports of examination of this captured enemy materiel, made at Edgewood Arsenal in the latter part of 1943.

Smoke Pot

German smoke pot Nb.K.S. 39B was especially designed for use with the armored vehicle smoke projector. It is made from a 25-gauge (U. S.) steel can, 3-5/8 inches in diameter and 5-3/4 inches high, with 1/4 inch lips on top and bottom. It is painted dark green with a red priming coat inside and out.

The pot weighs approximately 4-1/2 lbs. and contains about 4 lbs. of pressed smoke mix of the following composition:

Zinc	43.4%
Red lead oxide (Pb ₃ O ₄)	3.6
Hexachloroethane (by difference)	53.0
	100.0%

The cover for the pot is made from steel of the same thickness as the body and is crimped on with a zinc plate (32 gauge) underneath,

having in the center a zinc well 1-7/8 inches deep and 5/16 inch in diameter. The cover is fitted in the center with a collar 3/16 inch high, 13/16 inch outside diameter and 3/8 inch inside diameter, threaded to take the pull igniter. There are two 5/8 inch vent holes, 2-1/4 inches between centers, in the cover (see Figure 1).

The Zundladungen (Zdlg. 4), or starter charge for the smoke pot consists of a 20-gauge aluminum cylinder 1-3/4 inches long and 9/32 inch in diameter, the closed end being painted with a light green band 5/8 inch wide. There is an aluminum cup, 1/4 inch long and 1/4 inch in diameter, open at the lower end; the upper end having a 1/16 inch hole located 1/8 inch from the open end of the cylinder. This cup contains 0.17 gram of a delay train mixture of the following composition:

Silicon, crystalline	15%
Red lead oxide (Pb ₃ O ₄)	85
	100%

A starter composition weighing 2.1 grams is located below the cup. The starter contains:

Lead chromate	50%
Silicon, crystalline	25
Potassium perchlorate	25
	100%

The complete starter charge weighs 3.1 grams. For protection in shipping, it is provided with a purple cardboard cap, 3/16 inch long. The charges are packed 12 to a cardboard or metal box.

The pot burns for about three minutes and emits an excellent volume of dense smoke that forms a good screen in a wind having a velocity of 3 to 5 miles per hour. The Nb.K.S. 39B pot

Fig. 1

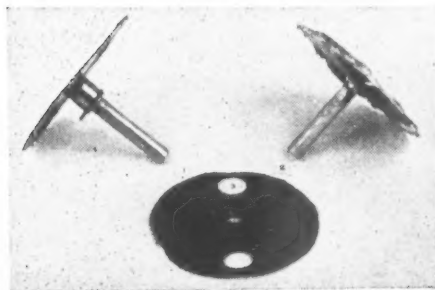


Fig. 2

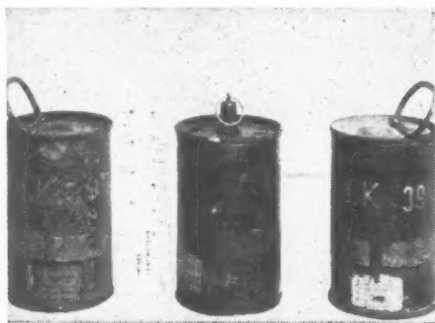


Fig. 3



¹Munitions Division; formerly 2nd Lt., U. S. Marine Corps.
²Scientific Director; formerly Colonel, Chemical Warfare Service.

is illustrated in Figure 2, along with two similar German smoke munitions designed for hand operation. Figure 3 shows the smoke cloud produced by the German pot in comparison with the cloud emitted by the standard M1 U. S. Army smoke pot.

Projector

The projector consists of three barrels affixed to a bracket which is mounted one on each side of the vehicle. On the German Mark VI and later model Mark III tanks, the projectors are mounted at a 45° elevation, one bank on each side of the turret. This permits the development of a continuous line smoke screen in front of the tank when all six smoke pots are fired at once. The dismantled projector is shown in Figure 4 and the components of the projector in Figure 5. The projector is shown mounted on the turret of a German PzKw tank in Figure 6.

The bracket is a piece of 3/8 inch steel plate, 11-15/16 inches wide, with three arms 3-9/16 inches wide, 5/8 inch apart, 5 inches long and bent at angles of 45°, 60° and 75°, respectively. There are two 5/8 inch bolt holes 2 inches apart on the flat portion of the bracket for mounting. The arms have a 1-3/4 inch radius on the ends, with a 1/2 inch hole tapped at the center of the radius to take an electric squib.

The barrels are bolted to the arms of the bracket with the aid of special lock washers. Each barrel is 6-1/4 inches long with a 4 inch outside diameter and 3-11/16 inch bore. They are made from a length of wrought iron pipe closed at the base by welding in a 3/8 inch plate disc having a diameter of 3-11/16 inches. Each barrel has a 1/4 inch hole drilled in the side near the base, apparently to permit water to drain out of the barrel. At the mouth of each barrel is a pair of slots, 3/4 inch deep and 3/4 inch wide, to facilitate the insertion and removal of the smoke pots.

Fig. 4

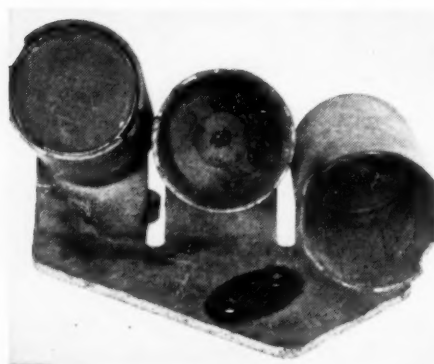


Fig. 5



Fig. 6



On the under side of each barrel is a plastic block, 2 inches long and 1-1/4 inches across at the widest part. This houses the single pin contact in the center of a 5/8 inch hole. It is held in place over the electric squib by a spring clip and is fastened to a 3 inch length of chain, attached to the bracket to prevent loss.

Electric Squib

The squib screws into the center of the barrel from the under side of the bracket arm. At first glance the squib can be mistaken for a percussion primer because of its unique construction, i.e., the brass body is grounded and the contact point is the same color of brass which makes it resemble a primer. The squib weighs 10.2 grams, is 9/16 inch high and has a body diameter of 1/2 inch with a 5/8 inch diameter bottom shoulder. The shoulder is 3/32 inch thick and is milled 1/16 inch deep on two sides to provide a 7/16 inch wide flat so that an end wrench can be used for tightening. The body of the squib is threaded.

A description of the internal construction of the squib follows. The electrical ignition unit is inserted into a brass case. This consists of a machined brass piece 1/4 inch long, with a head 5/16 inch in diameter and a shank 1/8 inch in diameter and 1/8 inch long, with a 1/64 inch thick coating of plastic insulating material. It is the end of this shank which can be mistaken for a primer on the bottom of the squib. The head of this brass component contains an iron foil-graphited paper electric bridge and a small amount of an unidentified heat-sensitive compound. A thin piece of brass foil is placed over the electrical ignition unit. A brass plug, 5/8 inch in diameter and 1/16 inch thick and having a 3/32 inch bore, is screwed down over the washer. On top of the plug there is a black powder pellet, 3/8 inch in diameter and 1/8 inch thick. Above this pellet is a thin aluminum foil.

A small amount of white powdered material, perhaps a mixture of lead thiocyanate, potassium chlorate and sulfur, is on top of the aluminum foil. The end of the brass body is crimped over a brass foil closure disc.

Ejection Charge

The ejection charge is contained in a transparent celluloid box, 1-1/2 inches in diameter and 9/32 inch thick, with a plastic adapter threaded to fit the collar of the smoke pot. The assembly weighs 8.8 grams.

The celluloid box is formed from interlocking top and bottom lids, each 0.02 inch thick. The bottom lid has a depression 1/32 inch deep and 1/2 inch in diameter, with five 1/32 inch holes equally spaced in the depression. The depression is filled with a white powdered material consisting of potassium perchlorate, lead thiocyanate, sulfur and an unidentified organic binder.

The adapter is attached to the top lid by inserting it through a 3/8 inch hole in the lid and sealing a box-shaped piece of celluloid over the head of the adapter.

The ejection charge consists of 4.5 grams of polished, granular black powder; the particle size being between U. S. Army grades A4 and A5.

Electrical Circuit

As with most automotive electrical circuits, the body of the tank and hence the bracket is grounded to one terminal of the battery. Each station of the smoke projector has a wire from a separate contact switch inside the vehicle leading to the spring contact point. The circuit is completed in the squib.

Assembly of a Round

A complete round for the smoke projector is assembled by:

1. Removing spring contact block underneath the barrel, removing the discharged electric squib, screwing in another squib tightly and replacing the spring contact block.

2. Placing a starter charge (Zdlg. N4), green end down, into the well of a Nb.K.S. 39B pot (the Nb.K.S. 39, Nb.K. 39 and Nb.K. 39B can also be used) and screwing in an ejection charge.

3. Placing the smoke pot, ejection charge down, into the barrel.

Functional Characteristics

The smoke projector received was fired by placing it in a hole in the ground so that the sides and bottom of the projector were supported. The pot was projected 35 yards, the barrel being

at an elevation of approximately 30°. It was ignited almost immediately after impact and burned for 3 minutes, giving an excellent smoke screen in a 4 m.p.h. wind.

The range obtained was short because the projector was driven into the ground about 5 inches by the setback. A tank-mounted projector would give greater range.

The smoke projectors cannot be loaded from within the armored vehicle.

Acknowledgment

The illustration used as Figure 6 was taken from a photograph furnished through the courtesy of the Foreign Materiel Branch, Ordnance Department, Aberdeen Proving Ground, Aberdeen, Md.

CIVILIAN AWARDS

The New York Chemical Procurement District on 21 January 1948 presented Meritorious Civilian Service awards to two employees, Mary A. Sandomenico and John A. Schmitt.

Mrs. Sandomenico was presented her award in "recognition for an established and inspiring record of performance of assigned tasks, excellent spirit of cooperation and dependability, materially contributing to the efficient operation and high morale in the New York Chemical Procurement District during the war period."

Mr. Schmitt's award was in "recognition for an established and inspiring record of performance of assigned tasks, excellent spirit of cooperation, and outstanding accomplishment in security measures, which materially contributed to the efficient operation and high morale in the New York Chemical Procurement District during the war period."

LT. JOSEPH L. BEALS DROWNED

It has been learned that 1st Lt. Joseph L. Beals, Post Engineer, San Jose Project, Fort Clayton, Panama Canal Zone, was among four United States citizens who were drowned when a launch sank in the Pacuare River near Puerto Limon on 5 February 1948.

Lt. Beals entered the Army in 1943. He graduated from the 38th OCS at the Army Chemical Center, Maryland, and was commissioned a second lieutenant on 26 January 1946. Upon completion of the 12th Combat and Service Course he was assigned to the San Jose Project in April 1946. He was promoted to first lieutenant on 22 August 1947.

His home address was Ennis, Mont.

The 256th Goes From War to Peace

Upon the surrender of Japan, the combat mission of the 256th Chemical Laboratory, located in Quezon City, P. I., came to an end. Demobilization and redeployment soon stripped the organization of its chemists and trained personnel. Apparently there was no longer any work to be done except to prepare for inactivation.

In October 1946, Lt. Col. C. B. Drennon, Jr., Chief Chemical Officer, AFWESPAC, held a conference with Major J. W. Boyd and 1st Lt. T. Carney, Commanding Officer and Executive Officer, respectively, of the company for the purpose of discussing possible projects and outlining the future program for the laboratory. A review was made of the excess Chemical Corps materials in the Chemical Depot and projects set up to ascertain which of these war materials could possibly be converted to peacetime use. After this, the program was finalized and Col. Drennon directed that work be started immediately. With the assistance of the Adjutant General, AFWESPAC, additional partially-trained personnel were obtained. In January, Lts. D. E. Kalish and John Bachelder, and Wayne S. Petersen were assigned to the company, thus providing trained chemists for supervision. With the organization thus rounded out, Col. Drennon, believing the Chemical Corps had a service to offer the other technical services in the theater, announced to the Commanding General's Staff that the Chemical Corps was ready to assist any organization in their chemical problems.

The Chemical Depot had in stock a quantity of FS Smoke mixture excess to the theater's needs. The theater was critically short of battery acid electrolyte. What was more natural than to convert the FS Smoke mixture? Breaking down the chloro sulfonic acid and sulfur trioxide, the main constituents of FS Smoke mixture, with water to form 95 percent sulfuric acid was simple,

but trouble with iron impurity kept causing difficulties until small amounts of nitric acid were introduced which not only oxidized the soluble ferrous sulphate to insoluble ferric sulphate, but also seemingly oxidized organic matter off as CO_2 , thus eliminating both high iron content and organic coloring from the sulfuric acid products. The acid was then decanted off, filtered through glass wool, with a resulting product being a colorless acid with a specific gravity of 1.8. This concentrated acid was diluted and issued to the Ordnance and other technical services. To date the laboratory has produced over 8,000 gallons of battery electrolyte. An indication of the value of this acid to the command can be gathered by the following quotations from letters received by Colonel Drennon. Letter to the Commanding General, Philippines-Ryukyus Command, subject, "Assistance from 256th Laboratory (M)", from Headquarters PHILRYCOM Ordnance Depot.

"Since 1 Jan 47 the 256th Chemical Laboratory (Mobile) has furnished the maintenance Operations Division with approximately 5,000 gallons of sulfuric acid electrolyte which has been used in servicing batteries received in a dry state as well as in the rebuilding of unserviceable batteries. It is estimated that this electrolyte, which has been in short supply from time to time, has permitted the placing in service of approximately 10,000 storage batteries with no delays resulting from electrolyte shortage. From the foregoing, it may be seen that the services of the 256th Chemical Laboratory (Mobile) were a definite contribution to keeping a substantial number of vehicles on the road."

Letter to Commanding Officer, Chemical Service, subject, "Appreciation of Services," from PHILRYCOM Quartermaster Depot.

"This Depot has been requisitioning on the Laboratory for sulphuric acid, weed killer and



floor wax. Some months ago, badly-needed trucks were deadlined for a lack of wet type storage batteries, thus causing backlogs of required supplies to pile up. The batteries were on hand but without acid and so of no practical value. A supply of sulphuric acid was obtained from your Laboratory and from time to time as needed the Depot Property Officer has continued to requisition acid to cover normal demand."

Not only was there a critical shortage of battery electrolyte in the theater but there was an equally critical shortage of batteries. The Ordnance Service requested the aid of the Laboratory in an effort to develop a method of rebuilding batteries that had apparently become useless and were being salvaged. Under the supervision of Lt. Wayne S. Petersen, a research program was set up and after two months of concentrated effort some success was attained. A battery declared useless, but rebuilt by the Laboratory, has now withstood over 3,000 miles driving in a jeep and two months' storage. All information and research data was given to Ordnance and under Lt. Petersen's technical guidance an assembly line for rebuilding batteries was set up by Ordnance. The success of the program is indicated by the following excerpt of a letter from the PHILRYCOM Ordnance Depot to the Commanding General, PHILRYCOM.

"During the past several months the 256th Chemical Laboratory (M) has been working with this Division in developing a process to rehabilitate storage battery plates which are now beyond any known reclamation procedure because of the deterioration of the active materials therein. It is understood that the 256th Chemical Laboratory (Mobile) has successfully developed on a pilot basis a process for restoring the plates chemically thus permitting the successful rebuilding of approximately 75 percent of the unserviceable batteries received for reclamation instead of 10 percent as was previously the case. From a brief description of the process furnished this office, it is believed that it can be successfully employed in a large scale battery rebuilding operation using comparatively unskilled labor. The problem of securing sufficient batteries for issue has become increasingly acute as new batteries are being received from the States in decreasing quantities and depot stocks of batteries approach depletion."

Security of depots has been a continuing problem in the Philippines. Due to the heavy rainfall, grass grows so rapidly it is almost impossible to keep it cut around the depot fences. This problem was brought to the attention of the Laboratory and upon the request of Col. Drennon,

the Chemical Officer, AFMIDPAC furnished several formulae for the manufacture of weed killer. The Laboratory prepared several types and ran extensive field tests, with the final result being the manufacture of over 1,000 gallons of weed killer with DANC as the basis. The value of this weed killer can be appreciated by reference to a letter from the PHILRYCOM Quartermaster Depot to Lt. Col. Drennon.

"The Depot, comprising 267 acres and with a perimeter of approximately 6 miles, is situated on highly fertile land with the result that grass cutting inside, outside and between the double fences which surround the depot is a constant work project. For security reasons, the grass along the fences is kept down by cutting it with bolos. The total area involved uses up a constant daily average of 60 men. The Depot recently secured from your Laboratory 600 gallons of weed killer and the technical assistance of a Laboratory officer to teach depot personnel its application. While its application is too recent to judge its real effective value, it appears that it may solve a great deal of the present problems of grass control and will reduce our gross detail from 60 to 6 men."

The Chemical Depot had in storage thousands of cans of shoe impregnate for which there was apparently no useful purpose. Lt. Daniel E. Kalish, being an old floor wax man, believed he could manufacture a suitable floor wax with the impregnate as a base. To date, over 3,000 pounds of wax has been produced and issued to organizations, officers' clubs, and for use in the headquarters building of this command. The demand for floor wax is great but the Laboratory is out of the wax business due to lack of shoe impregnate. The value of this wax is best indicated by the following expression from the PHILRYCOM QM Depot.

"Floor preservatives such as paint and varnish being nonexistent, a perfect substitute was found in floor wax compounded in your Laboratory. One of its chief values at first was the fact that it could be applied over old oily wood floors. The headquarters building (300' x 300') being located adjacent to Highway 54, is particularly vulnerable to dust. It is surrounded by a wide parking area which has been recently oiled but which was for months a very bad dust developer. It was not unusual on a windy day to be unable to see the length of the building because of dust. After the wood floor had been waxed it was found that floating dust was negligible and the cleaning and dusting made easier. The janitorial staff was reduced from 12 men to 5 men. The

main aisles are rewaxed once a month but the rest of the floor area occupied by desks has been waxed only once and that was about six months ago. The appearance of the floor is satisfactory both from its general appearance, cleanliness, and lack of splinters."

Thus another apparently useless war material was converted to peacetime use.

Brake fluid was another very critical item for a while in the Philippines. Lt. John Batchelder was given the job of producing a substitute. As with all other projects assigned to the Laboratory, he succeeded. This fluid, made from neutralized castor oil, cellosolve, carbitol and ethylene glycole, was used in several motor pools until a supply was received from the States, thus preventing the deadlining of needed vehicles.

Another product manufactured for the Ordnance which has proven highly useful was a flushing fluid prepared from acetylene tetrachloride and 5 percent pyridene.

On 30 September 1947 the Ordnance Depot made the following request of the Chemical Service.

"Due to requirements for parts which have not been available through normal supply channels, Chemical laboratory assistance is frequently required to manufacture or remanufacture such parts locally. For example, at the present time the local manufacture of synthetic rubber cups for hydraulic braking system and fuel pump diaphragms presents a chemical problem due to possible deteriorating action of brake fluid and gasoline on material employed."

This problem was referred to the 256th Laboratory and Lt. Petersen began a tedious bit of research. Hardening the diaphragm with metallic selenium, zinc sulphate, sulfur and carbon black and vulcanizing at 140° C. finally rendered a tough, pliable diaphragm impervious to gasoline. The results speak for themselves. Where formerly diaphragms were breaking down at four to eight hours' operation, test engines equipped with the Laboratory-treated diaphragms have up to the present been running well over 700 hours and are still functioning perfectly.

The E15 DDT disperser with its unique four-way "Norton" valve was introduced into this theater by the 256th Chemical Laboratory. The work of converting the M2 Smoke Generator into a DDT disperser, steam jenny, smoke generator, and weed burner was performed expeditiously and the demonstration at the 50th Chemical Depot on 10 October 1947 attracted large numbers of high ranking military personnel. The uniqueness and versatility of the E15 drew the admiration and wonder of all those present. At the

conclusion of the demonstration, Lt. Col. C. B. Drennon invited the audience to the Laboratory area to observe an item display of the achievements of the 256th Chemical Laboratory.

Further exhaustive experimentation of the E15 as a DDT disperser has been carried on in close conjunction with the Engineer Service, Medical Service, and the Philippine Bureau of Public Health. Data collected at the numerous locations in Luzon Island, at which the DDT disperser was operated, proved conclusively that 100 percent mosquito knockdown was evinced and a larval counts in swamp areas were reduced to practically nothing.

The E15 used as a steam jenny has proven to be one of the handiest and most economical grease cutters in the theater. Heavy accumulations of road tar, dirt and oil on vehicle undercarriages were found to be easily loosened and blasted off by introducing oil in conjunction with water through the heating coils of the converted M2 Smoke Generator. The high increase in temperature apparent from the oil accomplished what the plain steam could not.

Thus the 256th Chemical Laboratory (M), with personal direction by the PHILRYCOM Chemical Officer, Lt. Col. C. B. Drennon, Jr., successfully changed over from its combat mission to the mission of "Converting Wartime Material to Peacetime Use."

The 256th Chemical Laboratory is at present under the command of 1st Lt. Daniel E. Kalish, with 1st Lt. Wayne S. Petersen as chief of research. T/3 Alfred Tagudar, S/Sgt. Magbual, T/3 Glenn Armstrong (now at the U. S. Military Academy), T/4 Austermann (leaving for the U. S. Military Academy shortly), T/4 John Giblin, T/4 Thomas Gabriel, T/4 Fred Arnold, T/4 Guidinas and T/4 Kallgren are a part of the EM personnel whose untiring efforts have made the 256th Chemical Laboratory's name a byword in the PHILRYCOM Command, at the same time procuring a great deal of favorable opinion for the Chemical Service.

KIRWAN NAMED TECHNICAL EDITOR

Mr. Philip T. Kirwan has been appointed technical editor in the Information and Editorial Branch, Technical Services Division, Chemical Corps Technical Command, Army Chemical Center, Md. He was previously a senior technical aide in the Office of Scientific Research and Development, Washington, serving in the Liaison Office and in Division 3, NDRC (Rocket Ordnance).

Suggestion Systems Play Peacetime Role

Management Convinced They Improve Employee Morale, Efficiency

By ROBERT M. BLEIBERG

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Barron's National Business and Financial Weekly

After several decades of toying half-heartedly with the idea, American industry has finally made the employee suggestion system an integral part of its peacetime industrial relations program. In its new full-dress role, qualified observers believe, the suggestion system can make important contributions both to labor-management amity and to operating efficiency.

Suggestion systems are not a new idea. Business had a nodding acquaintance with them before the turn of the century, and by 1920 such large companies as Standard Oil (New Jersey), Eastman Kodak, General Electric, Westinghouse, Goodrich, Goodyear, and the Radio Corp. of America had successful plans in operation. During this period, however, most company suggestion systems were run on a highly perfunctory basis. There was little cooperation from top management, no scientific, coordinated procedure, and often outright hostility from supervisory personnel. As a result, it has been authoritatively estimated that 95 percent of all attempts to run such systems ended in failure.

The advent of the war and the attendant great premium placed on saving time, labor and money led to a tremendous burgeoning of suggestion systems. Under the urging of the War Production Board, labor-management committees were organized in the country's industries, and one of their main jobs was the administration of company suggestion systems. Although the wartime achievements of the systems received wide publicity (estimates of the time and money saved running into hundreds of millions of man-hours and tens of millions of dollars), it was still a debatable question after VJ-Day whether the suggestion system, like the labor-management committee, was just another war baby, destined for quick extinction.

The experience of the past two years has proved their permanency. As one executive commented, "There are more successful systems in operation today than during the war."

Despite the lack of any conclusive overall statistics to document this point, evidence as to its accuracy can be found on many sides. A number of large companies have installed successful systems since the end of the war. The National

Biscuit Co., for example, after studying more than 250 existing plans, adopted a suggestion system ten months ago. Since the plan has been in operation, the company has processed 7,000 suggestions and accepted over 500. It has paid out more than \$10,000. According to H. J. Richey, Nabisco's suggestion system director, "interest continues to grow."

The flourishing National Association of Suggestion Systems, an organization of the officials who run the various company programs, is another sign of the idea's vigor. In the fall of last year, 500 representatives from companies giving employment to more than ten million people gathered in Chicago for a two-day conference. This year's conference is expected to attract at least 700.

On the roster of new members joining the N.A.S.S. in the past few months are Armour & Co., the C. & O. Railway, General Motors' Delco Appliances Division, the Marine Trust Co. of Buffalo, General Electric Co.'s Electronics Division, the General Ice Cream Corp., and Pan American Airways' Latin-American Division.

Many companies, in addition, have modernized existing systems over the past year or two to bring them into line with the principles of correct suggestion system operation that have now become generally accepted. Trans-World Airlines completely revamped its system, in operation since 1939, when a drastic slackening in employee interest indicated that the administration of the system was faulty. The Coleman Co., anticipating a falling off in the number of suggestions at the end of the war, gave its program fresh impetus by concentrating on one or two products each month, and by increasing its cash awards. Lever Bros., Ryerson & Son, Inc., Pullman-Standard Mfg. Co., the Metropolitan Life Insurance Co., the Peoples Gas Light & Coke Co. of Chicago and many others have also made their suggestion systems more effective.

After an anticipated decline in employee interest with the war's end, furthermore, suggestion system administrators have noted a firmly rising trend in the number of suggestions handed in. Western Electric's R. E. Loesges has calculated that suggestions are currently flowing into his office at the rate of 1,500 to 2,000 a month, compared with little more than 1,000, on the average,

during 1944-1946. The Heinz Co. last May paid out the highest total of awards in two years. Remington Rand's suggestion system administrator, and president of the N.A.S.S., F. A. Denz, summed up the situation in a letter to *Barron's*:

"Suggestion systems are definitely working as well for industry, commerce and finance as they did during the wartime years . . . Savings during the past two years have been on a par with those of the war."

Industry's acceptance today of the part suggestion systems can play in industrial relations stems from its gradual realization of the many advantages a well-run suggestion plan has to offer. Foremost in the minds of the executives administering the plans is the boost the system gives employee morale. It makes the worker feel appreciated, and gives his ideas access to the inner sanctum of top management.

There are very few things management can do about labor suspicions and resentments, that can have such a devastating effect on productivity. A suggestion plan offers one of the most effective ways of improving employee attitudes," one executive remarked.

Other advantages, intangible but nonetheless considered highly important, are the improved efficiency that will naturally result from having an alert, keenly interested working force on the job, the valuable training a suggestion system affords both employees and executives, the improved public relations that tend to follow from improved employee relations and the added safety.

Furthermore, for those interested in the monetary savings, it is pointed out that any well-run suggestion system almost certainly pays for itself after a time and in many cases shows a profit, sometimes a substantial one. In the opinion of Glen A. Mooney of Westinghouse Electric Co., in the past five years his company has realized an estimated saving of approximately \$1 million a year from suggestions adopted. Suggestion system people emphasize, however, that no plan should be installed with the exclusive idea of running it as a money-making device. This was one of the primary difficulties in the prewar period, as they see it, and in the long run defeated its own purposes by arousing employee hostility.

How does today's scientific suggestion system differ from the hit and miss plans of the twenties and thirties? In the first place, after much necessary trial and error, the know-how of the systems has been developed. It is now recognized that constant publicity is needed, that rejection letters

must be personalized, and that promptness in processing suggestions is essential.

It is also generally accepted that cooperation from top management is imperative. If the company president lends his authority to any suggestion plan by personally handing out large awards or by signing letters, lower supervisory echelons which are in a position to hamstring the plan quickly fall into line. In one of the latest and best suggestion plans adopted, the General Suggestion Board having final judgment comprises two assistants to the president, the vice-presidents in charge of industrial relations and production, and the comptroller.

Army Day, 1948

(Continued from page 15)

velopment program of the Chemical Corps are included various miscellaneous technical operations, such as specifications, drawings, and directives; procurement information on items not covered by specifications; photographing and blueprinting; library services; patent work, including purchase of licenses and assignments; editorial work and reports; shop maintenance; inspection gauge design; inspection manuals; safety and technical manuals; cooperative work with civilian industries; cooperative work with National Research Council, technical assistance with production facilities; chemical warfare materiel museum; maintenance of technical equipment; technical in-service training of civilian personnel; technical assistance with research and development facilities; animal colony and insectuary, Medical Division; paint spray respirator; disposal of surplus chemical materials. Advances in these miscellaneous technical operations have been commensurate with advances in the other technical developments of the Chemical Corps. The titles are briefly descriptive of the functions performed.

Miscellaneous technical operations will vary in accordance with the requirements of warfare as related to the Chemical Corps. As the requirements for new developments appear, work will be initiated either by the establishment of a new project or by inclusion under miscellaneous technical operations. New projects for miscellaneous technical operations will be added as required.

"Fire For Effect"

(Continued from page 20)

a fire mission from the company FDC and fired on constant elevation.

After the collapse of all resistance in the Ruhr Pocket, we accompanied III Corps on a long march south to join the Third Army on the final drive of the war. The battalion moved 270 miles black-out driving at night and closed on the DP within 2 minutes of the required time without the loss of a single vehicle or man, a remarkable achievement of route reconnaissance and march discipline. We were committed on arrival and supported various divisions in assault crossings of Isar Danube and Isar Rivers and many smaller streams. Most of the campaign was a "rat-race" with the fighting quite light compared with the kind we had in previous campaigns. In some spots the SS diehards offered fierce resistance. Such a group in the village of Eining on the Danube put up a good fight and gave one of our infantry battalions a very bloody nose. Our infantry withdrew and Company A with 12 mortars removed Eining from the map. We were carrying excess ammunition so I told the company CO

to pour it on. He did and it was beautiful. Then the infantry went through standing up and without a casualty.

When VE-Day came we were within sight of the Alps and near the Inn River. III Corps sent us back to Nurnberg to restore order and act as security troops. There we led a glorious life, soft beds, electric lights and running water for every man in the battalion and 1,500 German prisoners to do fatigue for us. We stayed there and enjoyed it right up to the time we left for home.

So here is a sketch and a very rough one of the training and combat operations of a 4.2 chemical mortar battalion. Into all of this went no small amount of my own "blood, sweat and tears." There was a great deal of hard work and quite a little suffering and there were many moments of bitterness. But there were also times of good fun and laughter, a good many thrills, and always that deep sense of pride which fine soldiers have in their own outfits. For whatever I gave to the battalion I was repaid in full measure every time I watched our keen and eager mortar crews go to work when the call came down, "FIRE FOR EFFECT!"

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Russian Aerial Release Case

An interesting item of aerial incendiary attack equipment has recently been acquired by the Chemical Corps Materiel Museum at the Army Chemical Center, Maryland, in the form of the Russian aerial release case AK-2, used for the dispersion of containers for chemical and incendiary agents from airplanes. The museum is a branch of the Technical Services Division, Chemical Corps Technical Command.

The AK-2 release case consists of 16 hollow tubes, each about 4½ feet long and 5 inches in diameter, arranged in two rows in a chrome-molybdenum frame, for holding spherical incendiary or vesicant containers.

The containers are thin-walled tin balls, slightly less than 5 inches in diameter. These spheres are made of segments, welded together, so that they disintegrate upon striking the ground, scattering the filling over the terrain. The content of each sphere is about 1 liter; fillings used are about 2 pounds of a 50-50 mustard-Lewisite mixture or about 2 pounds of a solution of yellow phosphorus in technical carbon disulfide.

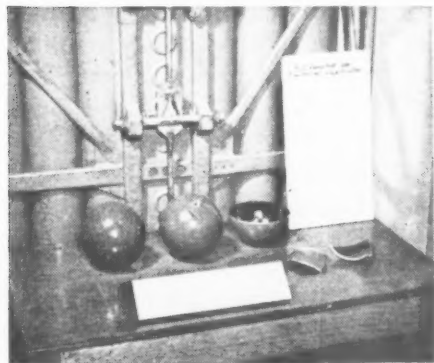
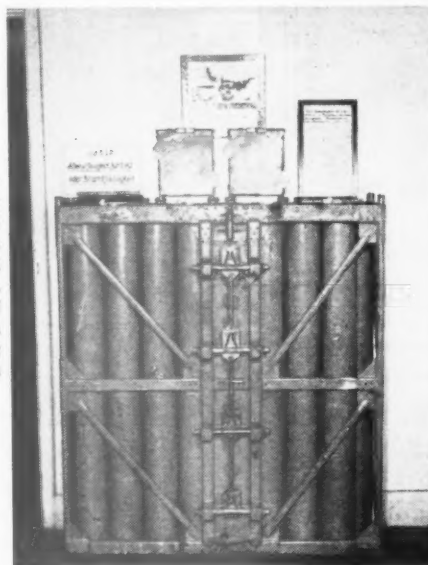
In use, the AK-2 release case is suspended vertically in the airplane bomb bay, with the mouth of the tube pointing downward. Prior to discharge, the tubes are closed by remotely controlled lids, each of which covers the opening of four tubes.

Each tube contains 15 of the spherical containers, so that the case holds a total of 240 containers. The case discharges in 1½ seconds. A document captured from the Germans indicates that the Russian transport-bomber TB-3 was the airplane chiefly equipped with these cases. Four cases were built in the airplane to give a total capacity of 960 individual containers. As each container follows its own path after release, the only control over dispersion was achieved by

variations in the altitude of the airplane, according to F. W. Stengle, curator of the museum.

The Russian release case AK-2 was shipped to the Chemical Corps Materiel Museum as part of the captured German Chemical Warfare Museum, which had been incorporated in the German Army Gas Defense School (Heeresgasschutz Schule) at Celle, Germany. The AK-2 case was captured from the Russians by the Germans in 1942.

Russian aerial release case AK-2 used for the dispersion of spherical containers filled with chemical or incendiary agents. The case consists of 16 hollow tubes, each about 4½ feet long and 5 inches in diameter.



Thin-walled spherical containers used with the Russian aerial release case. The spheres are made of segments, welded together, and disintegrate upon striking the ground.

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The Discovery of Mustard Gas

Some Notes on the Discovery of Mustard Gas
(The following correspondence relating to the original development of mustard gas will be of interest to readers of THE JOURNAL.—ED.)

CHEMICAL CORPS TECHNICAL COMMAND

17 December 1947

Professor Hans T. Clarke
Columbia University
College of Physicians and Surgeons
New York City

Dear Professor Clarke:

In recent conversations with Dr. E. Emmet Reid on the history of the development of mustard gas, Dr. Reid gave us some of the details of your connection with the original finding that mustard gas is extremely vesicant, a discovery which was later put to use when it was employed as a chemical warfare agent.

I have a hazy recollection of having read some of this in one of the popular books on chemistry about fifteen years ago. However, we believe it would be highly desirable for us to have a record of your experiences in this connection on file in the Chemical Corps. I am therefore writing to you to find out if you could oblige us by writing out your recollections on your laboratory experiences with mustard for our files. This would be a valuable reference to personnel who are interested in the mustard problem. We would also appreciate from you a statement as to whether you would approve use of any of your remarks in publications from the Chemical Corps.

Very truly yours,

R. MACY
Chief, Chemical Division

COLUMBIA UNIVERSITY
COLLEGE OF PHYSICIANS AND SURGEONS

December 23, 1947

Dr. R. Macy, Chief
Chemical Division
Chemical Corps Technical Command
Army Chemical Center, Maryland

Dear Dr. Macy:

In response to your inquiry of December 17th I hasten to assure you that I was in no way responsible for the original discovery of the

vesicant properties of mustard gas. This was entirely the work of Victor Meyer, who reported his findings in 1886 (Ber., 19, 3259). Reference to the toxicity of B,B'-dichloro ethyl sulfide and B-monochloro diethyl sulfide was made in the Textbook of Organic Chemistry by Meyer and Jacobson (Vol. 1, Part 2, p. 211, 2nd Ed., 1913), but little attention to the fact appears to have been given by organic chemists prior to World War I.

My own experience with the dichloro compound occurred in 1911-1912 in the laboratory of Emil Fischer in Berlin, where I experienced the toxic effects in my own person, firstly by contact with the fingers and later, through the breakage of a flask containing a solution of the substance in petroleum ether, on the leg. The latter mishap resulted in a burn involving hospitalization for nearly two months. A reprint of an article in which my experiments were reported is enclosed.*

I cannot avoid the suspicion that the use of mustard gas in chemical warfare by the Germans around 1915 is ascribable to the fact that Emil Fischer, who visited me while I was in the hospital, reported the case to the German Chemical Society towards the end of 1911. I was later informed that the vesicant properties of mustard gas were drawn to the attention of British army authorities early in 1915 but that it was not considered by them as likely to be a useful military weapon until they had observed its effects from the receiving end.

Please feel free to quote from the above in publications from your Command.

Yours very truly,

/s/ HANS T. CLARKE

*Transactions of the Chemical Society, 101, 1585-1590 (1912).

LT. HOME TO PLANTS DIVISION

1st Lt. William MacGregor Home has been assigned to the Operating Branch of the Plants Division, Chemical Corps Technical Command, Army Chemical Center, Md. During the war Lt. Home served as an Infantry officer with the 75th Infantry Division in the European Theater. He was separated from the service in August 1946 and returned to active duty in June 1947. He was assigned to the 4th Infantry Division and subsequently was transferred to the Chemical Corps. Lt. Home was graduated from the University of Washington with a B.S. degree in chemical engineering.

DU PONT'S WAR STORY

(Continued from page 12)

as praising the speed with which the giant arsenal had been put into operation.

On February 20, 1943, the first half of the M1 plant was ready for operation and on March 13 it started operations, using purchased arsenic trichloride and thionyl chloride, which were later produced at the arsenal.

Close-Out of Du Pont's Project

In April, 1943, Du Pont closed out its offices at Denver, having completed all its contract services with the exception of a small amount of work which could be directed from Wilmington.

On April 17, 1943, the Army-Navy "E" was awarded to the Rocky Mountain Arsenal, and all six firms under prime contract to the government participated in the ceremonies. Col. T. F. Farrell, executive officer, construction division, Office of the Chief of Engineers, stated in the presentation address that the final cost was estimated to be almost \$11,000,000 under the original estimate of \$32,000,000.

EDGEWOOD PERSONNEL NOTES

Major Robert K. Nelson, Cml.C., has been appointed Chief, Production Division of Edgewood

Arsenal at the Army Chemical Center, Maryland. Major Nelson recently attended the University of Pennsylvania where he was a graduate student of the Wharton School of Finance and Commerce.

Captain Harold E. Johnson has returned to the Army Chemical Center from the Detachment of Patients at Valley Forge General Hospital, in Phoenixville, Pa. Capt. Johnson will take up his duties with the Eastern Chemical Depot, Army Chemical Center.

1st Lt. William R. Emslie has been assigned to the Supply and Procurement Division, Office of the Chief, Chemical Corps, Army Chemical Center, Maryland. Lt. Emslie was formerly stationed at Huntsville Arsenal, Alabama.

Major. Leo K. Stone, recently returned to active duty, has been assigned to the Organization and Equipment Planning Office and Post Claims Office of the Army Chemical Center, Md.

Brooks F. Smith has been named Assistant Chief of the Test Division, Chemical Corps Technical Command, Army Chemical Center, Md. Louis Benjamin continues as Chief of that division.

George H. Milly has been appointed Chief of the Planning and Evaluation Branch, a recently established unit of the Test Division, Chemical Corps Technical Command, Army Chemical Center, Md.

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Chlorowax 40
(Liquid Chlorinated
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CARROLL E. ADAMS

Col., Cml.C. Ret.
President, Boston Chapter



1916

June 20—Enlisted as private in A Battery, Rhode Island Field Artillery, National Guard. Age at enlistment: 21 years.

1918

May 1—Reported to Saumur Field Artillery School, Saumur, France.

July 31—Graduated number one in class of 77, with general average of 93.45 percent.

Aug. 1—Commissioned 2d Lieutenant and ordered to Heavy Artillery School, Angers, France.

September 13—Graduated and named in orders as "Distinguished Graduate." Appointed instructor at Heavy Artillery School.

1919

May 13—Discharged from Service at Camp Devens, Mass.

1940

September 18—Commissioned Captain, Chemical Warfare Service.

1941

January 25—Reported for active duty, Boston Chemical Warfare Procurement District.

June 1—Appointed Acting Executive Officer.

1942

February 1—Promoted to Major.

May 8—Appointed Contracting Officer in addition to duties as Executive Officer.

October 1—Promoted to Lt. Colonel.

1941-1942—Periods of service in Canada as member, Inspection Board, United Kingdom and Canada.

1945

August 17—Three days after VJ-Day relieved as Executive Officer at Boston Chemical Warfare

Procurement District and sent to Waltham Regional Hospital (now Murphy General Hospital) for observation and treatment.

December 29—Promoted to Colonel and relieved from active duty.

1946

April 13—Separated from Service.

1947

June 6—Appointed Colonel, Honorary Reserve.

Personal Record

June 13, 1895—Born in New York City.

June 1909—Graduated from Hackensack, N. J., Grammar School.

June 1911—Two years at Morris High School, New York City. (Member Delta Sigma Nu Secondary School Fraternity.)

June 13, 1913—Graduated from Pratt Institute, Brooklyn, N. Y., in Mechanical Engineering.

1913-1916—Employed in bare wire and copper rod mill; draftsman with consulting engineering firm; engineer with cotton finishing plant.

1919-1927—Superintendent in weatherproof insulated copper wire mill.

April 5, 1920—Married at Pawtucket, R. I.

April 18, 1921—Son, Henry Clay Adams, born in Providence, R. I.

June 7, 1923—Son, Carroll Edward Adams, Jr., born in Pawtucket, R. I.

1927-1931—Engineer with coal tar products concern.

1931-1940—Treasurer and general manager of machine tool manufacturing company.

1946 to date—Consulting Engineer.

Past Master Union Lodge No. 10, Free and Accepted Masons, Pawtucket, R. I.

Member Pawtucket Royal Arch Chapter No. 4, Pawtucket, R. I.; Holy Sepulchre Commandery, No. 8, Knights Templar, Pawtucket, R. I.; Providence Consistory, 32nd Degree Masons; Palestine Temple, Nobles of the Mystic Shrine.

Past President, Narragansett Bay Chapter No. 14, National Sojourners.

President, Boston Chapter, Chemical Corps Association.

Member, Reserve Officers Association.

Member, Yankee Division Veterans Association.

Henry Clay Adams, son, commissioned 2nd Lieutenant, C.A.C., February 1942. Served overseas in New Zealand, New Caledonia and Guadalcanal. Transferred to Chemical Warfare Service. Chemical Officer at atom bomb tests at Bikini.

Carroll E. Adams, Jr., son, at Brown University for two years, graduated from United States Military Academy, West Point, N. Y., June 1945.

C. B. DRENNON, JR.

Colonel, Cml.C.



Born in Georgia 25 April 1910. Attended public schools in Georgia and high school in Covington, Ga. Entered Georgia School of Technology in 1927 and graduated in 1931 with B.S. degree in Chemical Engineering. Was awarded teaching fellowship at University of North Carolina. Was commissioned 2nd Lieutenant in Infantry, transferred to CWS in 1932. After graduation accepted position with Bibb Mfg. Co., Macon, Ga., as foreman of cotton dyeing. On active duty with CCC, 1933-1937. Was successively office engineer, Asst. District and District Engineer for Federal Works Agency. Attended CWS Line and Staff Officers School, 1940. Ordered to active duty 1940 and served in the following capacities:

Assistant to Chief, War Plans Division, September 1940 to January 1941.

Assistant to Chief, Industrial Engineering Division, January 1941 to July 1941.

Assistant Chief, Engineering Division, Huntsville Arsenal, Alabama, July 1941 to November 1941.

Assistant Chief, Production Division, Pine Bluff Arsenal, Arkansas, December 1941 to May 1943.

Chief, Production Division, P.B.A., May 1943 to March 1945.

Chief, Pyrotechnics Division, Technical Command, E. A., March 1945 to October 1945 (a short tour overseas in the Pacific Theater during this period).

Chief, Munitions Division, October 1945 to July 1946. (Pyrotechnics and Munitions Divisions were combined and reorganized by Col. Drennon.)

Chief, Chemical Officer, AFWESPAC, later Philippines-Ryukyus Command, and Commanding Officer, Chemical Service, Philippines, October 1946 to present date.

Promotions: 1st Lieutenant to Captain, May

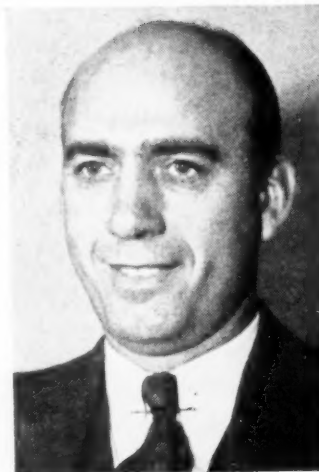
1940; to Major, 1 February 1942; to Lt. Colonel, 25 August 1942.

Decorations: Legion of Merit, awarded Army Commendation Ribbon, Purple Heart.

ORVILLE O. KENWORTHY

Lt. Col., Cml. Res.

President, Cleveland Chapter



Born October 14, 1910, in Owasso, Okla. Graduated from Beggs, Okla., High School in 1928. Received B.S., 1932, and M.S., 1934, in Chemistry from Oklahoma A. & M. College, Stillwater, Okla. Employed as Color Technologist, Sales & Service, with B. F. Drakenfield & Co., Inc., Washington, Pa., and

New York City from June 1934 to February 1942.

Entered Armed Forces February 14, 1942, as 1st Lieutenant, CWS. Discharged August 14, 1946, as Lt. Colonel, CWS. Decorations include Army Commendation Ribbon with Oak Leaf Cluster, Pacific Theater Ribbon with one battle star, American Theater Ribbon, Victory Medal and Philippine Liberation Ribbon.

Now employed at Ferro Enamel Corporation as research chemist and group leader covering all research on colors for porcelain enamel, pottery, glass and plastics.

Married Mary J. Ferrar of Washington, Pa., on June 7, 1935, and have two sons, Orville Franklin, born October 7, 1937, and Robert Owen, born April 8, 1942.

Reserve Activity: Chemical Officer of 83rd Reserve Division, with headquarters in Cleveland, Ohio.

Member of American Chemical Society, Phi Lambda Upsilon, Reserve Officers Association, Chemical Corps Association.

Civilian activities include: Assistant Cub Master, Cub Pack No. 5, Lakewood, Ohio; Superintendent Junior High Sunday School of Lakewood Congregational Church; contributing editor to *Isotopics* for Cleveland Section, ACS; President, Cleveland Chapter, CCA.

Hobbies: Reading, golf, bowling.

ROY A. LAMB

Major, Cml. Res.
President, Dallas Chapter



Born September 21, 1908, at Mt. Vernon, Texas. Received education in Dallas schools. Resides at 6036 Martel Street, Dallas, Texas. Is Vice President in charge of Engineering of the Merla Tool Corporation, general partner of the Pan-American Engineering Company, general partner of the Exporting &

Importing Company, and member of the Board of Directors of the Gulf States Sand & Gravel Company. Married Pauline Agnew December 7, 1929. Has one son, Charles Paul, age 14; one daughter, Nelda Jean, age 17.

Mr. Lamb is a member of the Reserve Officers Association, American Society of Mechanical Engineers, North Texas Foreign Trade Association, and is currently president of the Dallas Chapter of the Chemical Corps Association. He is a member of the Ridgecrest Baptist Church.

Military History: Appointed First Lieutenant, CWS-AUS, August 1942; advanced to Captain March 1943; advanced to Major April 1944; released from active duty on November 14, 1945. During his stint with CWS was attached to the Dallas Chemical Warfare Procurement District and in 1943 became Chief of the Inspection Office. Previously had served as officer in charge of the CWS Procurement Office in Houston, Texas.

WALTER J. MAYS

Secretary-Treasurer, Pine Bluff Chapter



Mr. Mays was elected Secretary-Treasurer of Pine Bluff Chapter Chemical Corps Association on March 26, 1946. He has been a civilian employee in the Chemical Corps since August 2, 1919, and was on detached service with the Chemical Corps in World War I at the first gas school at Goundre

Court, France, stationed at Edgewood Arsenal from August 2, 1919, to December 8, 1941. He has been at Pine Bluff Arsenal since December 11, 1941, as Personnel Officer. Received Meritorious Civilian Service Award for World War II.

JOHN W. STOCKETT, JR.

Lt. Col., Cml. Res.
President, Washington Chapter



Born November 25, 1897, in Washington, D. C. Attended local schools, graduating from Tech High in 1916, and entered Cornell University the same year. Enlisted in the Navy in the fall of 1918 and was assigned to the Naval Flying Corps, M.I.T., Cambridge, Mass., for flying instruction. Separated from active duty shortly after the Armistice and returned to college. Graduated from Cornell University with the degree of Bachelor of Chemistry in June 1920. Spent one year in Cuba as chemist for the West India Sugar Finance Corporation. Connected with the lime industry from 1921-1942 as research chemist at the National Bureau of Standards; plant engineer for the Lee Lime Corporation, Massachusetts; salesman with the Belle Isle Lime Company, Detroit, Mich.; engineer for the National Lime Association, Washington, D. C.; chief of the Mineral Wool and Building Glass Unit of the War Production Board, 1941-1942. Ordered to duty November 11, 1942, and commissioned Captain in the Chemical Warfare Service; assigned to Arsenal Operations, Edgewood Arsenal, Maryland. Transferred to Navy and International Branch, Office of the Chief, Chemical Warfare Service, in August 1943. Received a letter of appreciation from Lt. General Vandegrift, Commandant of the Marine Corps, for expediting chemical warfare material to the Marines. Promoted to Major in September 1944. Awarded the Commendation Ribbon in 1945. Separated from active duty in October 1946 and promoted to Lt. Colonel. Entered on duty as a civilian with the Chemical Corps in January 1947 and assigned to the Plans and Operations Branch of the Plans, Training and Intelligence Division. Elected President of the D. C. Chapter of the Chemical Corps Association in May 1947.

JEROME F. McGINTY

Major, Cml. Res.



Married, 3 children. Attended Brooklyn Preparatory School and received B.A. from Fordham University in 1936 and LL.B. from Fordham University Law School in 1940. Admitted to the New York State Bar in 1940.

From 1936 to 1942, employed in sales capacity with Emil Greiner, New York City, manufacturers and distributors of laboratory and scientific glassware and reagent chemicals.

Was commissioned a 2nd Lieutenant in Coast Artillery Reserve in 1936 after attending ROTC courses while at Fordham University. Transferred from Coast Artillery to Chemical Warfare in 1942 and entered upon active duty as a 2nd Lieutenant in Chemical Warfare in June 1942. Stationed in Washington, D. C., assigned to Industrial Division in Office of Chief, Chemical Warfare Service, from July 1942 to August 1944. Transferred to New York in August 1946 and became Assistant Chief and Contracting Officer of the newly-formed Chemical Commodity Division. Separated from service as a Major in June 1946.

Since that date to the present has been Sales Manager of Millmaster Chemical Company, 551 Fifth Avenue, New York City, and associated corporations.

CHARLES STONE

Secretary, New York City Chapter



Born in New York City. Practiced law until he joined Chemical Warfare Service on November 11, 1941, as an assistant inspector, and by gradual promotion obtained the rank of Mechanical Engineer until his separation from the Chemical Corps in June 1947. At the time of his severance he was the

sole negotiator remaining with the service in the New York District. At the present time he is President of the Certified Abstract Corp., which concern is engaged in the examination of titles to real property. Was elected Secretary of the New York Chapter at its last annual meeting. The office of the New York Chapter is located in Room 716, 280 Broadway, New York 7, N. Y.

COL. UNMACHT

Colonel Unmacht started his military career at the age of 16 as a private in the famous Company A, 53rd Regiment, Iowa National Guard. This company always took the highest competitive honors.

He was a Lt. Colonel, Quartermaster Corps, in World War I, at that time the youngest Lt. Colonel in the Army. He entered the Regular Army on July 1, 1920, as a Captain, highest rank he could obtain because of his age.

Col. Unmacht was Chemical Officer, Hawaiian Department, when the Japs struck Pearl Harbor on December 7, 1941, and remained in the Pacific Ocean area throughout the entire war, returning April 7, 1947, as the result of an accident. He wears the maximum of nine gold service stripes.

Col. Unmacht is widely known in and out of the services. It was he who so successfully pioneered, developed and built all the tank-mounted flame throwers so successfully used in the Pacific, starting from a vacant piece of ground at Schofield Barracks, T. H. Some 250 such tanks were built under his personal supervision for both Army and Marines, using local skill and resources.

It was also Col. Unmacht who pioneered and developed the use of 4.2 chemical mortars on LC(Ms) which greatly assisted assaults on the beaches. At Iwo Jima, for example, 4 LCM's, each with 3 mortars, fired 14,500 rounds of 4.2, leading the way for the Marines to land. At Okinawa there were 48 of these mortar ships.

He was always a great believer that fire and flame would overcome the Japs, and in this he was ably supported by Gen. Robert C. Richardson, Jr., POA Commanding General, and Admiral Nimitz, on whose staff he was also Chemical

(Continued on page 49)



HOWARD V. WRIGHT

Secretary-Treasurer, Army Chemical Center Chapter



Born: Indianola, Iowa, June 4, 1892.

Education: A.B., Simpson College; M.S., Iowa State College; Chem. Engr., Iowa State College.

Instructor and Asst. Professor of Chem. Engr., Iowa State College, 1919-1924.

Chemical Engineer, Edgewood Arsenal, 1925 to date.

Chief, Plants Dept., Chemical Division, 1925-1932; Asst. Chief, Munitions Division, 1933-1938; Asst. Chief and Chief, Plants Design Dept., 1939-1940; Asst. Chief. and Chief, Plants Division, 1941 to date.

MILITARY-INDUSTRY PREPAREDNESS ANNOUNCED BY THE MUNITIONS BOARD

(Continued from page 8)

sufficient time in which to anticipate, study and overcome probable and potential production problems.

* * * * *

In releasing the detailed operating procedure on allocation of industrial capacity for procurement planning to the Technical Services, the Munitions Board directed: "The military departments are encouraged to maintain liaison with the Armed Forces Industrial Associations as sources of general information relating to industry-wide manufacturing capacity." *The Chemical Corps Association is one of the ten military associations listed to each planning agency.*

April, 1948

Unmacht

(Continued from page 48)

Officer. It was because of Col. Unmacht's efforts that eventually 80 percent of the bombs dropped on the Japs were incendiary. The original training in use of incendiary bombs by the Air Corps was conducted under Col. Unmacht's supervision.

At the start of the war Col. Unmacht equipped the entire civil population of Hawaii with gas masks and provided gas protection. More than 500,000 masks were issued to civilians and all personnel trained in their use. Seventy-eight thousand masks were rebuilt for small children, and 50,000 bunny masks manufactured for babies. All this work was done locally under Col. Unmacht's direction by volunteers, school teachers and school children in school buildings.

For these and other outstanding accomplishments Col. Unmacht was awarded the Legion of Merit, Oak Leaf Cluster, Commendation Ribbon and numerous commendations from all branches of the service as well as civilian organizations.

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Challenge to Our Chapters

By FRED M. JACOBS, *Secretary-Treasurer*

Since the Chemical Corps Association was activated two years ago, its membership has continued to grow. As was to be expected, this growth was especially marked in the period immediately following the birth of the Association, when new chapters were being continuously formed and when our membership as a consequence expanded by leaps and bounds. Following this initial period, certain of our chapters showed a most commendable spirit with regard to the drive for new members; they never for an instant let their efforts lag to retain all their old members nor allowed their zeal to diminish in gathering in new ones. It is to be regretted that the membership record of all of our chapters is not equally inspiring. There is a need on the part of each and every chapter to realize the validity of a couple of old aphorisms so far as the strength of our Association is concerned. One of these is that, "Things Never Stand Still in this World," and an equally appropriate one might be, "Nature Abhors a Vacuum." To show a comparative slight increase in membership, as is the case at present, is not enough. Like the ordinary business concern, our Association either grows steadily or it dies off.

In an effort to ascertain the facts behind the membership trends, National Headquarters recently inaugurated a survey. What we found was highly revealing. In the first place, it was disclosed that a minority of the chapters were particularly successful in obtaining renewals and in signing up new members. Secondly, it was brought to light, as might have been expected, that these same chapters were the ones which employed good management techniques in their membership drives. They adopted a system, which they punctiliously carried out, of parceling a list of members delinquent in their dues to a special committee which personally contacts the delinquents and reports the results of each call to the chairman of the committee. They do not stop at writing a letter; they either approach the delinquent member in person or reach him by phone. National Headquarters would like to take this opportunity to impress on each and every chapter the immense value of this procedure. If for any reason a list of delinquents is not available or is not up to date, National Headquarters will upon request from any chapter, furnish such a list.

National Headquarters wishes not only to be of assistance to every chapter in its efforts to

grow, but is directly expending considerable energy towards an increased membership. Recently the correct addresses of 2,500 Chemical officers were obtained and we are mailing out literature to each of these. We are including in each instance a copy of a pamphlet entitled, "Some Questions and Answers." Any chapter desiring a quantity of these pamphlets should contact headquarters. Please bear in mind, however, that in our opinion, nothing can take the place of personal contact in securing members.

One matter which is causing headquarters considerable concern is the problem of securing lists of key personnel who worked in Chemical Corps' installations during the war. A number of these employees have resigned and we do not have their present addresses. Not only are they potential members of our Association, but in the event of an emergency it would be invaluable to have a record of their whereabouts. Will the chapters please assist Headquarters by furnishing us the names of such personnel together with their present addresses?

Let all of us, then, put our shoulders to the wheel in this campaign, which by its very nature is continuous, to have our Association grow and wax strong.

Chemical Warfare in World War II

(Continued from page 5)

of accomplishment of which everyone associated with the Service will be proud.

Your Association takes pride in sponsoring the publication of this work, and sincerely believes that everyone who was in any way connected with the CWS during World War II, either as enlisted men, officers, civilians or in industrial capacities, will be interested in owning this book. In addition to the personal interest which Chemical Corps personnel will find in this volume, it will be a "must" for the libraries and training establishments throughout the Armed Forces. Staff officers generally should also find it extremely useful as a concise treatment of one of the Technical Services of the U. S. Army.

Publication date is 15 May, and the volume will be placed on sale at the annual meeting of the Association at Edgewood on 20-22 May. After the annual meeting orders will be filled from the Office of the Journal. For those who do not plan to attend the annual meeting at Edgewood, it is suggested that you send an advance order to the Journal in order to be sure of getting your copy out of the first printing. The book is priced at \$4.

CHAPTER NEWS

ARMY CHEMICAL CENTER CHAPTER

The Army Chemical Center Chapter held two meetings during the winter. At the October meeting Gen. Edward Montgomery, Air Chemical Officer, and Chemical Corps Association President Ludlow King were the guests of honor. General Montgomery gave a most interesting description of developments leading to the present close relationship between the Air Force and the Chemical Corps. On February 11, a cocktail party was held at the Gunpowder Club to allow the chapter members an opportunity to become better acquainted with the 40 new members of the Association.

On January 14th, Mr. L. Wilson Greene, Technical Command Scientific Director, was the speaker at a joint meeting of the Rochester Chapter of the Chemical Corps Association and the Rochester Chapter of the American Institute of Chemical Engineers.

The chapter is making extensive plans for the annual meeting of the Association at the Army Chemical Center on May 20-22, 1948. Arrangements are being made to entertain the large number of Association members expected to attend this event.

BALTIMORE CHAPTER

Baltimore has had three very successful meetings since the current season opened. Our attendance has been fair but not as large as we should like to have them. However, what we lacked in numbers was made up by the enthusiasm of those members who were present. It was, of course, inspired by the high type guest speakers that we had with us. In October, Mr. William Shirley, world traveler and lecturer who was interned in Europe for the war period, gave us a most interesting talk on his activities in Yugoslavia and Hungary during his enforced visit therein. After his talk, lasting more than an hour, he, not knowing the temper of his audience, asked if anyone had questions to ask. They did and it took him more than another hour to answer them. He was amazed and pleased as well at the interest in his heroic war effort and allied help.

On November 23, we had a small but most interested crowd at the Little Theatre of the McCormick Company building when Dr. R. W.

Gibson of the Applied Physics Laboratory, Johns Hopkins University, Silver Spring, Maryland, accepted our invitation to talk on "Some General Aspects of Guided Missiles." Dr. Gibson founded the groups which specialize in rocket propellants at Indian Head, Maryland, and the Universities of Minnesota and Wisconsin and Duke University. He served as chairman of the Rocket Propellant Panel of the Joint Committee on New Weapons and Equipment. In 1943 he became the first director of research at the Allegany Ballistics Laboratory near Cumberland, an establishment devoted to the development of solid fuel rockets, thrust units, and solid rocket propellants. It was an evening well to be remembered by those whose privilege it was to hear him—an outstanding authority in his field.

On February 19 we had Major Harding of the 2nd Army who spent the war period as a C.I.C. operator in the C.I.B. area. After an hour and a half of reminiscing and regaling us with his humorous as well as hair-raising experiences, he finally said, "Damn it, I'm tired, let me quit, won't you?" After another hour he said that it was equal to another tour of duty but how he enjoyed being with the crowd again! He's a great chap and a fine officer. You should have heard him.

As to the future, we are looking forward to our March meeting when we expect to have Captain Walter H. C. Rueggeberg, distinguished for his scientific research, as our guest speaker—and another highlight in the annals of the Baltimore Chapter.

For April we expect to have an informal get-together to discuss affiliated units and hope to have Col. Lentz of the 2nd Army or some other authority on the subject to be our guest speaker.

JAMES H. PYLE,
Secretary-Treasurer

BOSTON CHAPTER

Our winter meeting was held January 15 at the Hotel Puritan. Only eighteen attended, but we had return postal cards from thirty-five signifying that they were unable to attend because of the extremely bad weather, prior engagements, or for other reasons. Those present, however, after considerable discussion, set up the following committees:

Research and Development. Professor H. C. Weber of M.I.T., who was not present, later consented to head this committee. It will be recalled that Professor Weber was consultant to the CWS Laboratory at M.I.T. during the war, and is currently on General Waitt's Advisory Committee. Professor Weber will select and announce later the members of his committee, and we anticipate holding a meeting of this Committee some time later on in March, with Dr. Walter R. Kirner of the Research and Development Committee from National Headquarters.

Specifications. The Chairman of this committee is Lt. Col. Edmond S. Graves, Cml-Res., assisted by Millard Merryman of Crown Products, Lawrence. This committee, through the secretary, will maintain close co-ordination with Technical Command at Edgewood, regarding specifications undergoing revision or the setting up of new specifications. The committee already has work underway on one specification.

Extension Courses. Lt. Col. Albert A. Brown, Cml-Res., has consented to head this committee, with members to be announced at a later date. Two sub-courses, 40-23 Preparation of Reports I, and 50-3 Preparation of Reports II, have been accepted for initial work by Lt. Col. Carl L. Otto, Cml-Res., who is on the faculty at the University of Maine. We anticipate that we may best serve in this activity by reviewing courses prior to publication, where they fit in with any peculiar qualifications held by our members.

Industrial Mobilization. Mr. Earl E. Watson, President of the New England Fibre Company, Portsmouth, New Hampshire, is chairman of this committee. His members will be announced later.

Membership Committee. This committee has been set up, but no appointments made to date. Eventually, we anticipate having members from various parts of New England who will have the dual responsibility of getting new members and serving as "prodders" for attendance at meetings.

We anticipate holding our next regular meeting on April 15 in the afternoon, also at the Hotel Puritan. We trust that by this time Boston will be free of snow (which it is not at present).

CHENERY SALMON,
Secretary-Treasurer

CHICAGO CHAPTER

The Chicago Chapter, Chemical Corps Association, has completed its second year of activity and is pointing toward our meeting on April 6 which will be devoted exclusively to the subject of military procurement—the first of its type held by this chapter.

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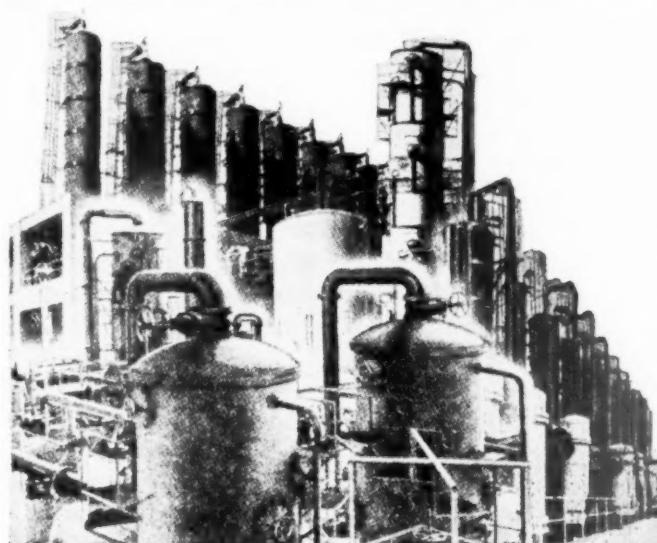
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Currently there is being undertaken a drive for one month for new members, using a combination of personal contact and direct mail. We hope to beat a previous record on direct mail and see if we can determine some way in which this type of membership solicitation can be made to pay for itself.

At our meeting in January we were addressed by Mr. M. A. Bell, President, Bell Machine Works, Oshkosh, Wisconsin (manufacturers of the 4.2 Chemical Mortar), who gave us a very interesting talk on his recent visit to Turkey and Europe.

Our February meeting was devoted to an evening of presentation of moving pictures of military subjects, including the titles "Fight for the Sky" and "Enough and On Time." These pictures were made available to us by Colonel Bramlet and Major Hurley.

At our March meeting we were addressed by Lieut. Arthur J. Andrews, USNA, who gave us a most interesting talk on his experiences in Japan, with particular emphasis on the disposal of enemy ammunition. Mr. Andrews highlighted his talk with a series of color slides showing some of the areas he covered in Japan.

The Chicago Chapter cordially invites members of the Association to attend its meetings which are held on the first Tuesday of each month from October to June.

CINCINNATI CHAPTER

Three meetings have been held this season. Two of these were joint meetings with the Chemical Corps Reserve Officers of Cincinnati and the Chief Chemical Corps furnished speakers for these.

Lt. Col. R. D. Chapman spoke in December in the training program as visualized by the Chief's office and Maj. Micheau of the general staff spoke in February on research and development policies of the Department of the Army. Our most interesting and enthusiastically attended meeting was held in November. Former Lt. Col. M. H. Bigelow of the Plaskon Division of Libbey-Owens-Ford Glass Company gave a most inspiring talk on his experiences in postwar Germany together with highlights on Reppe chemistry. This meeting was held in Cincinnati Club and was attended by thirty-five members.

A fourth meeting is planned in March at which former Col. L. Wilson Greene will speak. The annual meeting, including election of officers, will be held early in May.

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CLEVELAND CHAPTER

The last meeting of the Cleveland Chapter was held February 27, 1948. We had a very interesting meeting with about 25 members in attendance. A coffee talk was given by Mr. B. R. Jacobs of the Goodyear Tire & Rubber Co. His subject was "Goodyear's Participation in War Work." Mr. Jacobs gave a very excellent brief summary of the type of participation by Goodyear during the war. He emphasized the excellent job that was done in supplying rubber replicas of guns, boats, etc., which could be inflated to represent existing equipment. He further described how this was used effectively in the invasion of Normandy.

Our main speaker was Dr. J. A. Campbell, Assistant Professor of Chemistry at Oberlin College. He spoke on "Atomic Energy for War or Peace." Dr. Campbell is also the editor of the magazine "Isotopes" as published by the Cleveland Chapter of the Chemical Society. His discussion of Atomic Energy, we all agreed, was one of the finest ever given to a lay group. He pointed out the possible use of Atomic Energy in powering of battleships, also for power plant and civilian use, and gave us a thumbnail sketch of the other military possibilities of Atomic Energy.

D. J. CONNELLY, *Secretary*

EUROPEAN CHAPTER

Friday evening, 23 January 1948, saw a large gathering of Chemical Corps personnel and their ladies at the Kronberg Castle, presided over by Col. Milton T. Hankins, Chief of Chemical Corps, Hq. EUCOM, for the official opening of the European Chapter of the Chemical Corps Association. The evening commenced with a meeting of all persons present for the purpose of electing temporary officers for the chapter.

Lt. Col. Donald E. Yanka, Commanding Officer of the Hanau Chemical Corps Depot, was elected acting president; Lt. Col. T. P. Gahan, Commanding Officer of the Air Chemical Center, USAFE, 1st vice president; Lt. Col. Roland P. Fournier, Executive Officer of the Chemical Corps, Hq. EUCOM, 2nd vice president, and Lt. J. N. Elliott, Hanau Chemical Corps Depot, as secretary-treasurer.

The meeting was followed by a social gathering, dinner and dancing in the ballroom. The evening was voted a complete success by all those present and ended with the announcement that the next meeting of the chapter, to be held in the near future, will be for the purpose of electing permanent officers and discussing the business of the chapter, and that this will be followed by many more "ladies' nights."

NEW YORK CHAPTER

The New York Chapter of the Chemical Corps will hold a general business meeting on April 20. Further details of this meeting will be sent to all members of the New York Chapter in the near future.

The New York Chapter has an executive committee which meets monthly to discuss and plan future activities and policies. This committee is composed of the following members:

S. N. Cummings, D. Calo, W. Clark, T. Pickering, C. Brinkman, J. P. Gerity, H. F. Zimmerman, J. O. Logan.

The officers of the Chapter are members ex-officio.

In addition to the executive committee, the New York Chapter also has an activities committee. The Chairman of this committee is Charles Brinkman and other members include:

B. Keating, P. Lo Bue, W. Gibbons, J. Munhall, L. T. Sutherland.

The Research and Development committee, which is coordinating its activities with Walter R. Kirner, Chairman of the National Committee, has as its Chairman, Dr. L. T. Sutherland of the chapter's Research and Development Committee.

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PHILIPPINE CHAPTER

An interesting insight into the organization and operations of the Chemical Corps of the Army of the Philippines was given by its chief, Major F. W. Medina, at the January meeting of the Philippine Chapter, Chemical Corps Association, held recently in Manila.

Tracing the history of the Philippine Army Chemical Corps since its inception years ago, Major Medina, whose military training includes stints at Fort Benning and the Command and General Staff School, stressed the fine start his branch had received with the assistance of the U. S. Army Chemical Service, and gave a clear and enlightening picture of its part in the present Philippines plan for national defense.

"Although the size of our branch is small," Major Medina said, "it is progressing rapidly in its research and in the training of personnel."

The service chief also expressed hope that the harmonious relations between the United States Army and the Philippine Army would continue.

Lt. Col. Clarence B. Drennon, Jr., Chief of the Chemical Corps in the Philippines-Ryukyus Command, and president of the chapter, presided at the meeting and assured Major Medina that the chapter was ready to assist his group in any respect.

Colonel Drennon touched on the early history of our service and compared the early difficulties encountered with those enumerated by Major Medina.

The chapter head also outlined plans for future sessions, all of which will be featured by a conference and discussion of matters of interest by the members and guest speakers. The February meeting will be in the form of a dinner meeting, to be held on February 28 at Gregory Officers' Club, Philippine University Site. The speaker at this meeting will be Dr. Melecio Toledo, Professor of Political Science, University of the Philippines, who will speak on the organization and operation of the Philippine Government.

Also present at the meeting were Mesdames C. B. Drennon, Jr., E. N. Wester, A. E. Isch, D. I. Saunders, S. Brown, C. M. Shadle and R. Delisle, wives of members who have arrived in Manila within the past two or three months.

Plans were laid for a boat trip to be enjoyed shortly by the members, their wives and guests.

ROCHESTER CHAPTER

Our last meeting of the Rochester Chapter was held March 2, 1948, in the meeting rooms of the Organized Reserve, Sibley Tower Bldg. This was

a joint meeting with the 164th Or. Composite Group, and was preceded by a dinner in honor of the guest speaker, Col. John R. Wood, director of Medical Research, Chemical Corps Center, Edgewood Arsenal, Md.

Colonel Wood is an excellent speaker and chose as his subject "Chemical Warfare Research Contribution to Clinical Medicine." Colonel Wood's speech was highly complimented by those attending. In spite of the inclement weather, it is estimated that approximately sixty of both groups attended.

Although I do not believe it is news, we are proud to say that our present membership is 29 in number. Lt. John C. Fee also advises that his address is 58 Ridgeway Ave., Rochester 13, N. Y., and I would appreciate your changing the records.

The Rochester Chapter has chosen their delegates-at-large and you should be hearing from our president, Major Ernest Mohr, relative to same in the near future.

HAROLD WRIGHT, *Sec'y-Treas.*

ROCKY MOUNTAIN CHAPTER

A special meeting of the Rocky Mountain Chapter was held recently for the purpose of discussing activities for the coming year and to make recommendations for nomination of a Director-at-Large, as requested by National Headquarters. The members present at the meeting voted unanimously to submit the name of Dr. Julius Hyman, President of Julius Hyman & Co., located at Rocky Mountain Arsenal.

An active membership drive has been inaugurated and we are endeavoring to broaden the field of membership by contacting industrial and scientific installations and universities in this area.

A dinner and meeting will be held in Denver the first part of April and at that time definite plans will be made for increased activities for the coming year.

The chapter officers—Brig. Gen. Charles S. Shadle, USA (Ret.), president; Mr. Edward C. Thompson, 1st vice-president; Maj. William B. Simeral, 2nd vice-president; and Miss Jacquelyn M. Burgett, secretary-treasurer—wish to state that they will put forth every effort in making this chapter one of the most active in the Association.

NOTE: Wilmington Chapter news will be found on page 26.

The Secretary's Corner

By FRED M. JACOBS
Secretary-Treasurer

Our third Annual Meeting is looming ahead. I have just returned from a visit to the Army Chemical Center where I was much impressed with the progress that has been made in arranging for a wonderful time. Beside the pleasurable features we hope to enjoy at Edgewood, we expect to make a frank inventory of our accomplishments and what lies ahead.

Due to the changes in the headquarters office system and personnel, there has been a lack of contact with industry and chapters in the last few months. We will try to rectify that omission in the near future. Nothing in the way of letters or other communications can take the place of a good old-fashioned talk over events past and present, and discussions and exchanges of ideas with suggestions for betterments. As a matter of fact, we have received many suggestions to which we are giving much consideration. I am looking forward to attending the meeting at Edgewood where I can personally meet and talk these things over with you.

With the proposed change of name of your Association to Armed Forces Chemical Association and its attendant changes of records and cards, quite an additional job will fall on headquarters office, but we are used to such things as this and consider them more or less general routine. I do not think that it will add any appreciable burden to the chapters. One of the most gratifying reactions that I have experienced has been the great number of letters of approbation and appreciation of our Chemical Corps Journal. It makes you feel that here is a service to our members of which we may be justly proud. To illustrate what I mean I would like to quote from a letter just received from one of our past Chiefs, Major General Walter S. Baker:

"I will be greatly interested in keeping up with the activities of my old service through the periodical publications. I would miss them, so please keep me on the mailing list."

We believe that you will agree that the Journal is getting better every issue. Letters like this from our members coming in daily are gratifying indeed. At the last executive meeting, discussion was held concerning the incoming executive officers. It was held that officers should be elected from chapter outside of, as

well as those located in Washington. This is a matter that will probably be on the agenda at the annual meeting. While industry has steadfastly supported the Journal in maintaining its high caliber, we have lately fallen down slightly in volume due apparently to unsettled conditions in particular fields. Altogether, however, our Association has done quite well in the last year. Every day it becomes apparent that we are better geared and more enthusiastic for the job the Armed Forces may assign to us. Letters from our members to headquarters reflect a great willingness to do their part.

Consideration is being given by the Executive Committee to engage larger and better equipped quarters for the advantage of those of our visiting members who may wish to take advantage of telephone service or a meeting place for their convenience.

Invitations have been extended to members of other Associations to attend our annual meeting. You should make many new friends and have a really wonderful time. Make your reservations today.

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